

THE  
AMERICAN JOURNAL OF PHARMACY.

MARCH, 1860.

WEIGHTS OF THE PHARMACOPŒIA.

By ALFRED B. TAYLOR.

There seems to prevail a very general impression that the Medical Convention for Revising the Pharmacopœia will, at its approaching session, adopt, among other improvements, some reform in the system of Weights and Measures at present in use by apothecaries. Especially in view of the recent action of the London, Edinburg and Dublin Colleges upon the subject, does it seem probable that some similar modification will be expected and attempted here.

The incongruity and inconvenience of our present duplex tables of weights are too universally admitted to need a condemnation; and the method pursued to unite and harmonize these discordant elements by the British Colleges, after careful deliberation, might appear as being on the whole the simplest and best adapted to effect the object. Without altering the "Apothecaries' Table,"—that is, the *divisions* and *denominations* by which the pharmacist is accustomed to estimate in compounding his preparations,—the new British system simply reduces the Troy ounce to the value of the avoirdupois ounce. The latter ounce weighing  $437\frac{1}{2}$  grains, and the former ounce 480 grains, the new ounce is thus made to weigh  $\frac{437.5}{480.0}$  of its former amount; and all the other weights of the apothecary—bodily—are diminished in the same proportion, or, in other words, our grains, scruples, drachms and ounces are all reduced  $\frac{17}{192}$  (about  $\frac{1}{11}$ ) in weight.

With a full appreciation of the labor and consideration undoubtedly bestowed upon this reformation, and with as full an appreciation of the ability and high professional authority

enlisted in its favor on this side of the water, we yet venture to question its judiciousness, and to suggest what appears to us a preferable scheme. We confess that the new British system does seem to us very much like the discarding of a substance for the retention of a shadow. What virtue is there in 20 times — 3 times — 8 —, that these should be preserved after all their old significance is lost? The surrender of our very *standard* of pharmaceutical weight, the GRAIN, is a sacrifice which ought to be compensated by very undoubted advantages. The grain is perhaps the most important standard unit of our whole metrology. Not only is it at present the recognised measure of the physician and pharmacist throughout a great portion of Europe,\*—that in which chiefly is embodied the long-acquired experience and accumulated knowledge of the healing art,—the laboriously ascertained and accurately observed relations and values of all the more active portion of the *Materia Medica*,—but it is the measure, which outside of our profession is the one almost universally employed as the unit of comparison for all minute investigations and precise determinations.

Believing, therefore, that the *grain* is the weight that of all others we can least afford to lose, (unless at the price of a very perfect system in return,) we propose to retain this unit at its present value,—the 7000th part of the pound, and to *abolish all intermediate denominations*. This, it appears to us, would displace the anomalous “Troy weights” with the least practical inconvenience, and would form the simplest mode of reconciling our professional with the common or commercial system. Those who advocate a decimal system of division for weight would probably find this the very easiest and most expeditious method of introducing such a system; for if we had no other unit but the grain, we should of necessity group and compound it by our common decimal arithmetic.

If any one should take exception to the high numbers sometimes involved by this scheme, we would ask which is the more concise and distinct form,—the expression “875 grains,” or the expression “ $\text{ʒi.}$ ,  $\text{ʒvi.}$ ,  $\text{ʒj.}$ , and  $\text{gr. xv.}$ ?” Which is the more

\* Holland, which in 1817 adopted the French system of Weights and Measures, still retains the English “Apothecaries’ Weight.”



# WEIGHTS OF THE PHARMACOPŒIA.

easily written?—or which the more readily conceived and remembered? Much has been said in praise of the beautiful and simple system of the French; and we seek not here to underrate it: but we should like some earnest advocate of its adoption to show wherein the expression “8 *hecto-grammes*, 7 *deca-grammes*, and 5 *grammes*,” (which, translated from its Greek form into plain English, is “8 *hundred-grammes*, 7 *ten-grammes*, and 5 *grammes*;)” we should like the advocate of this, we say, to show in what respect it is better or more convenient than the simple expression, 875 *grammes*?

So far, then, as the “grain” should be thus employed, it would exhibit practically all the benefits of a decimal metrology, and, in a manner attended with the least possible sacrifice of, or interference with, established values and reckonings. It would relieve the physician from the mental effort of constant reductions in writing his prescriptions. It would have the good effect of dislodging that relic of Latin ignorance—the Roman numeration. It would have the further advantage of abolishing those superfluous cabalistic symbols of weight, which, however precious to the mystery of alchemic craft, are but little congenial with the frank, direct and catholic spirit of modern utilitarianism. And it would diminish materially the risk of error both in reading and in writing medical prescriptions, where error is, alas, too frequently of serious consequence.

There would probably be no occasion for carrying the employment of our proposed “grain unit” higher than 875 grains, —the eighth part of the pound. From and above this weight, we should propose the use of the *eighth-pound*, the *quarter-pound*, the *half-pound*, and the *pound*. The separate weights necessary for the carrying out of our project would be the following:—

Table of Weights.

1 gr.	2 grs.	4 grs.	8 grs.
10 grs.	20 grs.	40 grs.	80 grs.
100 grs.	200 grs.	400 grs.	800 grs.
$\frac{1}{8}$ lb.	$\frac{1}{4}$ lb.	$\frac{1}{2}$ lb.	1 lb.
(875 grs.)	(1750 grs.)	(3500 grs.)	(7000 grs.)

It will be seen that the plan here proposed disturbs nothing.

U of M

except to a slight extent, the present notation or mode of reading. All the values heretofore employed in the Pharmacopœia remain unchanged. This, in our opinion, gives the "grain scheme" a very great superiority to the *avoirdupois* scheme adopted by the British Colleges. It is true that their new series of weights differ from the old by only an eleventh part, (an amount perhaps not distinguishable by simple observation,) but this difference is as real, and in a very large majority of cases where these weights are to be applied, is as seriously important, as would be the substitution of the French *milligramme*. The difficulty and labor of acquiring a familiarity with the new weights, and the tedium of constant reductions for a long time to come, would also be as great as if a radically different system had been adopted. By the "grain scheme" no such difficulty would exist. The pharmacist and the physician would employ the notation by *grains*, the week after its adoption, with as much facility as they would the present system. Perhaps it would be more correct to say that they would experience an increased facility in its use.

An evil of no slight magnitude in this unnecessary disturbance of familiar values, and in the transitional disorganization unavoidably consequent upon it, is that it would prove a formidable obstruction to any higher and more useful reformation. Men, after having just passed through the labor of a long and troublesome apprenticeship required for the acquisition of any new system, are naturally indisposed to repeat the process soon again with another system, however excellent, or whatever the benefits it may ultimately promise. If the change proposed, therefore, is not one of such value and importance as is likely to secure a *general* and a *permanent* establishment,—if it is not as full and satisfactory a remedy of present ills as might be attained, and thus leaves much to be accomplished at some future time,—this question of the amount of disturbance involved by the substitution becomes a pertinent objection, and is one which should be thoroughly and thoughtfully considered. Not unfrequently have seeming improvements proved barriers to real reforms.

The practical application of the "grain scheme" is so obvious that it would appear scarcely necessary to present an example of its notation. Indeed our present Pharmacopœia exhibits



cases where the plan has been adopted in preference to the regular notation, to avoid the use of mixed quantities. Thus, the formula for "Fowler's Solution," (*Liquor Potassæ Arsenitis*), instead of employing  $\mathfrak{z}i.$ , gr. iv. for the ingredients, calls for 64 *grs.* each of arsenious acid and carbonate of potassa. In like manner, the formula for *Liquor Arsenici et Hydrargyri Iodidi*, instead of requiring  $\mathfrak{z}j.$ , gr. xv., calls for 35 *grs.* each of iodide of arsenic and red iodide of mercury. We may add here an example showing the character of change which would be ordinarily required. A simple formula will suffice, as that of the familiar "Dover's Powder," for instance.

*Pulvis Ipecacuanhæ et Opii.* (U. S. P.)

Take Ipecacuanha, in powder,	-	60	grs.
Opium, in powder,	-	60	"
Sulphate of Potassa	-	480	"

Rub them together into a very fine powder.

In cases such as these, this mode of writing would be even easier than the present mode; and it would have the advantage of presenting all the ingredients in measures of the same units, thereby greatly facilitating their comparison and computation, or the estimation of their several divisions where a given number of doses is contained in the preparation. There are, however, some preparations of the Pharmacopœia which are not so manageable, and which in their present form certainly exhibit very awkward proportions. Thus, in the preparation of *Acetum Opii*, (Black Drop,) the quantity of opium is prescribed at  $\mathfrak{z}viii.$  (3840 *grs.*, or 1 *half pound*, 340 *grs.*) for 3 pints and 4 ounces of the resulting solution. Now, it is not easy to perceive any good reason for such a proportion as this,—giving  $1181\frac{1}{3}$  *grs.* of opium to each pint of the preparation. The quantity of opium should be instead, 1152 grains to the pint, (1 *eighth-pound*, 277 *grs.*—a reduction of only  $29\frac{1}{3}$  *grs.* in the pint,) giving us the convenient proportion of 72 grains to the fluid ounce, (instead of as now,  $731\frac{1}{3}$  *grs.*), or of 9 grains to the fluid drachm. And the quantity directed by the formula should be either 1 pint, 2 pints, 4 pints, or 1 gallon. The binal progression (1 oz., 2 oz., 4 oz., 8 oz., 1 pint, 2 pints, &c.) should indeed be the law

of quantity for all the mixtures and solutions of the Pharmacopœia.

In the apportionment or distribution in pill preparations of the Pharmacopœia, a similar reform seems greatly needed. The quantities of different pills indicated by the several formulas are properly varied according to the nature and use of the preparation; but they are most usually ordered in numbers having a decimal expression. Thus, among the more common numbers will be found 80, 120, 180, 200, 240, 480, &c.—more inconvenient numbers than which for practical division could not easily be selected. To make a given mass into 180 pills, for instance, is quite a troublesome task, notwithstanding the great variety of factors this number can boast:—( $2 \times 90$ ;— $3 \times 60$ ;— $4 \times 45$ ;— $5 \times 36$ ;— $6 \times 30$ , &c.) The required number may be obtained either by dividing the mass into 12 parts of 15 pills each, or into 10 parts of 18 pills each, or what would be the more usual course, into 9 parts of 20 pills each. But to divide into three parts, and each of these again into three parts, would be very tedious and inconvenient; or to weigh the whole mass, and then weigh off one-ninth part, and divide into pills, and so on successively, would leave the last portion sensibly too light by the drying which would take place in the mean time. The pills would thus be found to be of very unequal value or strength; and the only way to avoid this would be to complete the nine independent weighings at once.

Now, if instead of a system of division so tedious and difficult, we made use of that simplest and most natural of all the scales,—the scale of *final division*,—we may carry the bisection to any extent, with the greatest facility and accuracy, and without any reference to the absolute weights of the several parts. It is the peculiar merit of this scale that we can divide by it any plastic mass, or any given quantity of powder, (or even of a liquid,) into halves, quarters, eighths, sixteenths, thirty-seconds, or sixty-fourths, &c., with perfect precision and with expedition, without the use of any weights whatever; an advantage that can be alleged of no other system of division. Moreover, in the case of a large pill-mass, it would evidently be of no consequence to the equality of the resulting pills what time had elapsed between the first and last division, or how much weight had been lost in the interim by evaporation.

The pill-machines of the pharmacist, as ordinarily constructed, are provided with twenty-four grooves, for the division of pills: a very suitable and convenient number. The reform, then, that we propose on this subject is, that accepting the number 24 as the unit, all the pill formulas should be based in quantity upon multiples of this unit, and in the binary scale of progression; that is, we would have all the pills of the Pharmacopœia ordered in quantities of 24, or of 48, (2 times 24,) or of 96, (4 times 24,) or of 192, (8 times 24,) or of 384, (16 times 24.) There is no occasion whatever for any intermediate quantities. An example or two of the change indicated will illustrate fully the project. Thus, the formula for the "Compound Cathartic Pills" of the Pharmacopœia specifies  $\text{ziv.}$ ,  $\text{ziii.}$  and  $\text{℥ii.}$  of the respective ingredients, and 180 for the number of the pills. The new form we propose would be as follows:—

*Pilulæ Catharticæ Compositæ.*

Take of Compound Extract of Colocynth	256 grs.
Extract of Jalap - - - -	192 "
Calomel - - - -	192 "
Gamboge - - - -	48 "

Mix and make into 192 pills.

The only difference between this pill and that of the Pharmacopœia is the use of one-fourth of a grain of gamboge, instead of the rather awkward amount of two-ninths of a grain, ( $\frac{2}{9}$  gr. in a dose, for  $\frac{2}{3}$  gr.)—an addition of  $\frac{1}{36}$  gr. to each pill, or of  $\frac{1}{12}$  gr. to the dose,—a difference wholly insignificant, when it is considered that the full dose of gamboge is from 2 to 6 grs. The object of this change is of course merely to avoid the inconvenient amount of  $42\frac{2}{3}$  grs., which would be required by the present formula.

*Pilulæ Ferri Iodidi. (U. S. P.)*

Take of Sulphate of Iron - - - -	72 grs.
Iodide of Potassium - - - -	96 "
Tragacanth, in powder - - - -	12 "
Sugar, in powder - - - -	36 "

Beat with syrup, and make into 48 pills.

*Pilulæ Ferri Compositæ.* (U. S. P.)

Take of Myrrh, in powder	-	-	-	-	144	grs.
Carbonate of Soda	-	-	-	-	72	"
Sulphate of iron	-	-	-	-	72	"
Syrup, q. s.						

Mix, and make into 96 pills.

*Pilulæ Scillæ Compositæ.* (U. S. P.)

Take of Squill, in powder	-	-	-	-	96	grs.
Ginger, in powder	-	-	-	-	192	"
Ammoniac, in powder	-	-	-	-	192	"
Soap	-	-	-	-	288	"
Syrup, q. s.						

Mix, and make into 192 pills.

*Pilulæ Aloës et Myrrhæ.* (U. S. P.)

Take of Aloes, in powder	-	-	-	-	768	grs.
Myrrh, in powder	-	-	-	-	384	"
Saffron	-	-	-	-	192	"
Syrup, q. s.						

Beat together, and make into 384 pills.

These formulas are sufficient to show the convenience of the system, and its adaptation to any range of quantities. By the apothecary, at least, the great advantages of this principle of distribution will, we imagine, be at once and universally recognised; and as it is upon him that the obligation of a faithful dispensation of the provisions of the Pharmacopœia rests, we suppose it will be generally conceded that his convenience should be chiefly consulted in a matter which, like this, can affect directly the interests of no one else.

*Philadelphia, Feb., 1860.*

## EXAMINATION OF OIL OF PEPPERMINT.

By JOHN M. MAISCH.

In the last volume of the Amer. Journ. Pharm., page 552, Mr. C. Bullock has drawn attention to an oil of peppermint which has made its appearance in our market, and which shows in many respects such a different behaviour from pure oil of peppermint, that it has been supposed to be an adulterated article. A sample of the oil has been subjected by Mr. E. Parrish to fractional distillation, and besides the resinous residue in the retort seven fractions were obtained: 1, below 300°; 2, 330°; 3, at the boiling point, 338°; as the boiling point now rose, the following fractions were collected: 4, below 344°; 5, below 360°; 6, below 430°; 7, above 430°F.; all were colorless except No. 7, which was of a light yellow.

These samples were handed to me for further examination, and Prof. Procter kindly furnished me with a specimen of oil of fireweed, (*Senecio hieracifolius*), which, it had been suggested, might probably be the adulteration. I likewise obtained a sample of double rectified German, of Borton's, and of an article called New Jersey oil of peppermint, of oil of cedar, and pure oil of spearmint, for comparing the various reactions. It is well to state here, that the above freshly distilled fractions were nearly inodorous; the faint smell could not be distinguished, and only that of the last portion reminded somewhat of peppermint.

My experiments make it certain that the oil has not been adulterated by the oils of fireweed and of cedar; but it appears to me more than probable that oil of turpentine is the fraudulent admixture.

Oil of fireweed dissolves at 60° in 9 parts of alcohol, and remains clear on the addition of 60 parts more; it dissolves iodine at 60° and 80°, with little reaction, and without the evolution of vapors, to a pale brownish red liquid, which spreads with a greenish color and evaporates entirely; from an ethereal solution of iodine, it takes up but little iodine and evaporates, leaving a soft resinous mass behind; with an ethereal solution of bromine it produces a hissing noise, and a yellow color, and evaporates without thickening previously.



Oil of red cedar dissolves at  $60^{\circ}$  in one part of alcohol, is rendered turbid by 2 $\frac{1}{2}$  parts, and not clear by the addition of 50 parts more; it dissolves iodine slowly without any visible reaction, and mixes with an ethereal solution of bromine to a colorless, clear liquid.

Borton's oil of peppermint is dissolved by one-half part of alcohol, and rendered turbid by another half part, and more; it takes up iodine with but little reaction, thereby assuming a red and brownish red color, without the least spreading; ethereal bromine yields a deep rose color, darkening to a purplish black, and thickening the oil. The rectified German oil agreed in its pure state, and when mixed with other oils, so nearly with Borton's oil, that the reactions of one are nearly identical with the reactions of the other.

The supposed spurious oil requires six parts of alcohol for solution, and remains clear on the addition of more; at  $60^{\circ}$ , iodine has but little effect, at  $80^{\circ}$  it is dissolved without fulmination, but with a quick radiating motion, without evolving any vapors, forming a reddish brown liquid, which scarcely shows any spreading. This oil mixed with ethereal solution of iodine and of bromine forms a thick brown liquid.

The fractional distillates dissolved, commencing with No. 1, in 8 $\frac{1}{2}$ , 8, 4, 7 $\frac{1}{2}$ , 7 $\frac{1}{2}$ , 7, 1, parts of alcohol and more. They fulminated with iodine, Nos. 3 and 6 last, evolved purple, yellow, grey or white vapors; the solutions were brown, variously shaded with green, Nos. 1 and 2 thin, 3 honeylike, 4, 5, and 6 more fluid than 3; they all showed spreading, 6 the least; No. 7 dissolved iodine to a homogeneous reddish brown liquid, without any reaction and without spreading. These reactions with iodine were observed at  $80^{\circ}$ ; at  $60^{\circ}$  no fulmination took place, only a quick dissolution or a radiating motion. With ethereal solution of iodine they produced uniform thin liquids of various shades of brown, containing a sediment of iodine. No. 7 was rendered reddish brown and thickening. With ethereal bromine they produced spreading liquids, 1, 2, 3, 4 colorless, 3, 4 with purplish spots, the liquids assuming a greenish tint; 5, yellowish green, 6, brownish yellow; both spreading, with a brown color; No. 7, behaviour of Borton's oil.

Towards nitroprusside of copper, the oils showed the following

behaviour: cedar, no change; fireweed, slowly golden yellow, clear; Borton's, pale green, clear; spurious, by continued boiling, light brownish yellow, turbid, soon clear; No. 7, green reddish brown, turbid, soon clearing; No. 1 assumes with difficulty a light yellow shade, turbid; the others remained nearly colorless, assuming with difficulty a scarcely observable brownish, greenish or yellowish tint.

It will appear from these reactions that an admixture with turpentine may be thought probable, and as I had occasion to rectify some turpentine, I experimented with it. It was perfectly colorless, and almost free of the peculiar penetrating odor and the hot, pungent taste of the common oil; it dissolves in 8 parts of alcohol at 60°, with 1-10th of Borton's peppermint in 7 parts, with 2-10ths in 3½ parts, and the solutions remain clear with more alcohol; mixtures with from 3-10ths to 9-10ths dissolve in ¾ or ½ part of alcohol, and the solutions are turbid with 1½ p. of alcohol.

The reactions of a mixture of 5 p. oil of turpentine with one of peppermint, when brought in contact with iodine at 60 and 80°, with ethereal solution of iodine and of bromine, and when continually boiled with nitroprusside of copper, are precisely the same as those of the fractions, particularly 3 and 4.

Fraction No. 7 agrees in many respects with Borton's oil; the principal difference is their solubility in alcohol. As I have been unable to produce a mixture of oil of peppermint with turpentine, cedar, fireweed, spearmint, and several other oils, which would dissolve in from one to three parts of alcohol, and more, I was at one time inclined to suppose the spurious oil in question to be the oil of some other species of mint, some of which have a resemblance in odor with peppermint. This supposition was strengthened on finding in Darlington's *Flora Cestrica*, page 340, the following sentence: "This species (*Mentha canadensis* s. *acutifolia*, var. *borealis*,) is not so pleasantly aromatic as the preceding (*M. piperita*), its flavor more resembling that of *Hedeoma* or pennyroyal." I was unable to obtain any further information regarding its odor, or to find any oil of this plant. As it is said to be a common herb, it would perhaps be well for some of our pharmacutists to direct their attention to it, with a view of ascertaining the properties of its oil, and whether the plant is distilled indiscriminately with peppermint.

Zeller requires good oil of peppermint to be soluble in between one and three parts of alcohol of .85, and to become turbid with more. I have not met with any great difficulties to procure oil of that behaviour towards alcohol of .835. The New Jersey oil mentioned above, however, dissolved in  $\frac{1}{2}$  p. alcohol and remained clear with 60 p. c. more; it dissolved iodine only by continued agitation, produced with ethereal bromine a green, spreading, scarcely thickening liquid, and was rendered yellow by nitroprusside of copper. I supposed this to be an adulterated oil; but since, I have obtained two specimens of Borton's oil, which, though agreeing in every other respect with the reactions of the above sample of his make, are dissolved by  $\frac{1}{2}$  and  $\frac{1}{4}$  parts of alcohol without being rendered turbid by more. Though crude oils, their flavor appears to be a pure peppermint, and the question now arises, What influence has the soil, the maturity, and the age of the herb on the solubility of the oil obtained from it? I consider it an important question, and probably some one who has access to peppermint plantations will take it up for the common benefit of all.

As the matter now stands, it seems to me that Zeller's test with alcohol cannot be relied on for *all* oil of peppermint. Borton's first specimen, when in excess in a mixture with oil of fireweed, dissolved in from  $\frac{1}{2}$  to 1 part of alcohol and become turbid by from  $1\frac{1}{2}$  to  $1\frac{3}{4}$  parts; with the fireweed in excess, it required more alcohol for solution, but even an admixture of .2 of peppermint, rendered the solution slightly cloudy though not milky.

On the other hand, to the last mentioned specimen of Borton's and the New Jersey oil, the property of dissolving in, and becoming turbid with, more alcohol, may be imparted by oil of red cedar; a mixture containing only .3 of the latter, dissolved in  $\frac{1}{2}$ , and was slightly turbid, with  $3\frac{1}{2}$  p. c. alcohol. But such mixtures were not changed in color by nitroprusside of copper, unless the boiling was continued for some time.

For the strength of the test liquids and the manner of applying the various reagents, I have to refer the reader to my papers in the Proceedings of the Amer. Pharm. Ass., for 1858 and 1859. The reactions of my rectified oil of turpentine were identical with those published in the Proceedings for 1859, page 345.

I am unable to give the precise per centage of turpentine in this oil. From 8 oz., Mr. Parrish obtained about 5 oz. of distillate, of which, No. 7 weighed about 1 oz.; the resinous residue in the retort not having been examined, the adulteration with turpentine must amount at least to 50 per cent.; but to judge from the solubility of the spurious oil in alcohol at 60° F., it may amount to more than 80 per cent. This latter supposition, though, is not verified by the behaviour of the undistilled spurious oil towards ethereal solution of bromine; the reaction with this test seems to indicate that the adulteration has been performed with a highly resinified oil of peppermint and oil of turpentine in about equal weights.

*Philadelphia, Feb., 1860.*

---

NEW PROCESS FOR THE PREPARATION OF VALERIANATE OF AMMONIA, IN DRY CRYSTALS.

BY BENJAMIN J. CREW.

Having experienced, along with many others, considerable difficulty in obtaining crystallized Valerianate of Ammonia in quantity, by any of the published formulæ, I was induced to make a series of experiments, which, having been entirely successful, I am willing to make public for the benefit of other operators.

The first step in the preparation of this salt is to procure the *monohydrated valerianic acid*, or the *oily inflammable acid*. The terhydrated acid will not produce crystals under any circumstances, or with any amount of manipulation; a very dense solution may be had, but it will not crystallize, even if the temperature be reduced to zero. To procure the monohydrated acid, take of valerianate of soda a convenient quantity, say 5 lbs., boiling water just sufficient to dissolve, strain the solution through muslin, if necessary, and add oil of vitriol by degrees until no further action is induced, or until the valerianate of soda is entirely decomposed. Allow the mixture to stand a short time, that the valerianic acid may rise to the surface and separate into a distinct layer, which may be drawn off with a syphon, separating funnel, or pipette. This acid (which still contains sufficient

water to prevent perfect crystallization) should be poured into a cylindrical jar, and treated with a small portion of oil of vitriol, and agitated by inserting a tube through the acid and blowing with the mouth; the passage and regurgitation of the air bubbles mixes the whole thoroughly; allow the mixture to stand a few minutes; the oil of vitriol seizes the water and subsides with it. Now test with a hydrometer the supernatant acid, and should it mark a sp. gr. of .950, this part of the process is complete; if above this, add a second portion of oil of vitriol, which should bring it to this degree of strength. The acid, after thorough subsidence may now be drawn off by either of the processes above indicated. As thus prepared it is somewhat colored, contains a small portion of sulphuric acid, and also a portion of water. From these impurities it is freed by distillation from a glass retort. In this process there are a few points to be attended to upon which perfect success must depend. The distillate should be received into a hydrometer jar, and each portion tested with a hydrometer. The first portion that comes over contains considerable water, and must be rejected and laid aside for further manipulation; when the distillate marks .940 it may be retained. The distillation is now proceeded with, producing a portion of acid of .930, until white vapors appear in the retort, when the gas flame is immediately withdrawn. The portion coming over first should be treated with oil of vitriol, the water abstracted and added to the retort, and the operation finished with care. The mixed distillates indicate a sp. gr. of about .933, perfectly clear, colorless, and of high refractive power. When thrown into water, it rises immediately to the surface, floating like an oil, burns with a blue flame, and acts with much energy upon the tongue and lips, producing a white spot and destroying the cuticle. The next stage of the process is far more simple and easy of execution, and consists in the saturation of the acid with dry gaseous ammonia, prepared by heating, in a suitable vessel, hydrate of lime and muriate of ammonia, in proper proportions, and passing the gas through a bottle containing fragments of quick lime. Ammonia is passed in until litmus paper is not acted on. No attention is paid to keeping the acid cool. The temperature rises to about  $150^{\circ}$ , keeping the liquid thin, and thus preventing the stoppage of the tube with crystals.



It should then be set aside to crystallize. In a few hours it becomes nearly or quite solid. If necessary, the crystals may be thrown upon a funnel, and allowed to drain, and finally laid upon bibulous paper. As thus prepared, they are perfectly snow-white, perfectly dry, and not deliquescent. Some specimens exposed to the air for several days appeared to effloresce.

*Philadelphia, 1st mo. 16, 1860.*

---

REMARKS ON PROPYLAMIN.

By DR. R. H. STABLER.

Esteemed Friend, Wm. Procter, Jr.:

In the number of the Journal for "March," 1859, the process for preparing Propylamin was published, together with the experience of Dr. Awenarius of St. Petersburg, as to its use in acute and chronic rheumatism, which appeared so well supported by well conducted clinical experiments as to entitle the remedy to a trial in this hitherto unmanageable disease.

I prepared a portion of it from herring pickle soon after reading the article, and induced some of our physicians to use it in their practice, which resulted in establishing its reputation amongst us as an indispensable remedy. It has been in use here about nine months, and has been administered in about fifty cases with most marked effect, seldom failing to give relief in twenty-four or thirty-six hours in acute cases, and a longer time in chronic rheumatism. I think its great value is demonstrated in acute rheumatism of young subjects, where the disease, unless quickly controlled, is so liable to attack the structures of the heart. One case of the kind presented in the practice of Dr. I. J. Murphy of this place, in a little boy; commencing with swelling of the knees, ancles and other joints, high fever, full, bounding pulse, and other symptoms promising a long, tedious case under the usual modes of treatment; he was directed to take the propylamin in the usual doses, [2 or 3 drops in water for an adult,] and was convalescent in three days. Another physician told me a few days ago he had used it with much satisfaction and uniform success.

A good deal has been published on the preparation and administration of the remedy in the Journal and other periodicals,

but nothing as to its use in this country that I have met with; thinking it might interest thy readers to describe our experience with it, and perhaps induce further trials of it, is my apology for troubling thee with this letter.

Thy friend,

R. H. STABLER, M. D.

Alexandria, 1st mo. 25th, 1860.

---

ON SOME PREPARATIONS OF CALAMUS ROOT.

By JOHN M. MAISCH.

The gratefully aromatic odor and taste of calamus root have caused it to be regarded as a valuable domestic medicine in many parts of this and the old continent; but the use of this drug in regular practice is extremely limited in this country. There can be but little doubt, that, in a great measure, this neglect of such a pleasant and strong indigenous aromatic is owing to the want of suitable pharmaceutical preparations which might be offered to the inquiring physician. In 1857, in a communication to the American Pharmaceutical Association, I have drawn attention to this fact, and suggested a tincture of the strength of four ounces to the pint. Lately, I have induced Mr. George E. Hayes, of Ga., a student of the Philadelphia College of Pharmacy, to make some experiments, with a view of arriving at concentrated and pleasant preparations of this hitherto neglected remedial agent. The following embraces Mr. Hayes' results, together with other observations and suggestions on the same subject:

*Extractum Calami Fluidum* was prepared from the powdered root in accordance with Professor Procter's directions for his sixth class of fluid extracts. (See Amer. Journ. Pharm., 1859.) Sixteen ounces of the powdered root passed through a sieve of 50 meshes to the inch, was moistened with alcohol, pressed into a cylindrical percolator, and alcohol allowed to slowly pass through it; the first 12 fluid ounces being reserved, the remainder of the tincture was evaporated below 160° to 4 fluid ounces, and added to the reserved portion. A slight turbidity was thereby occasioned and the extract was set aside to settle,

which process took place slowly but completely; the sediment proved to be entirely composed of larger and smaller globules of oil. I have separated a portion of this oil by means of a pipette, and distilled it from a solution of common salt in a small flask; the milky distillate, as well as the residue, was shaken with ether, and the ether allowed to evaporate in a watch crystal. The ether from the distillate left after evaporation a trace of volatile oil; that from the residue in the retort left a semi-fluid oleo-resinous mass, of a taste which was at first insipid, somewhat resembling the taste of good olive oil, but subsequently reminded strongly of the peculiar hot aromatic taste of calamus root; this latter product is doubtless the soft resin of Trommsdorff; the quantity obtained was too small to institute any further investigations. From the fact, however, that this resin was but partially soluble in alcohol of .835, while a large portion of it separated in oily drops, which were not soluble in alcohol, soluble in ether, and left a grease spot on paper, we have to conclude that calamus root, besides those constituents found by Trommsdorff, also contains some fixed oil. It must be remarked, that the root used for these experiments was derived from our indigenous plant and had not been peeled.

*Syrupus Calami.*

Take of Fluid extract of Calamus,	one fluid ounce,
Sugar,	fifteen ounces,
Water,	half a pint.

About one-half of the sugar is to be triturated with the fluid extract of calamus, and the mixture exposed to a moderate heat until all the alcohol has been evaporated; the remainder of the sugar is then added, and after the addition of the water, the whole is raised to the boiling point and strained. One pint of syrup is thus obtained which possesses the virtues of an ounce of the root; it is turbid like the syrups of tolu and ginger prepared in a similar manner. Incidentally, I may remark here, that in the syrups mentioned, we ought not to sacrifice strength to appearance; the tinctures of tolu and ginger when triturated with magnesia, and freed from alcohol by evaporation, will certainly yield a clear filtrate with water, and a transparent syrup on the addition of sugar; but the resins are wholly left behind

and they are by no means inactive in a medicinal point of view. If we therefore wish to preserve for these syrups the character of medicinal preparations, and not degrade them to mere flavoring liquids, we ought to retain besides the volatile oils also the resinous matters. The process of our present Pharmacopœia I consider unobjectionable, if strictly followed; frequent agitation of the powdered sugar while the alcohol is being evaporated, not only favors this process, but likewise the intimate mixture of sugar and resin, and the complete subsequent suspension of the insoluble matter in the saccharine liquid.

*Calamus Cordial.*—In attempting to make such a preparation from the above fluid extract, Mr. Hayes found that but a small portion of the same could be obtained in perfect solution in a diluted alcoholic liquid as they are generally employed for this class of fancy preparations. The following appeared to be the most available and pleasant:

Take of Fluid Extract of Calamus, two fluid drachms,  
 Tincture of Cinnamon,           “           “  
 Syrup of Orange Peel,       seven fluid ounces,  
 French Brandy,               seven and a half fluid ounces.

Mix them.

This preparation is transparent, of a reddish yellow color, and has a strong but agreeable calamus taste. The sugar of the syrup, which keeps the oleoresinous matter perfectly suspended, appears to rather better disguise the persistent calamus taste. The cordial contains a large amount of alcohol, and each tablespoonful represents nearly four grains of the root.

*Trochisci Calami.*—The following preparation is offered as a very agreeable way for giving calamus in cases of flatulency and dyspepsia.

Take of White sugar,                               six ounces,  
 Fluid Extract of Calamus,       one fluid ounce,  
 Oil of Fennel,                               twenty minims,  
 Oil of Aniseed,                               “           “

Rub them together, and with mucilage of tragacanth form a mass which is to be divided into 160 lozenges, each of which will represent three grains of calamus, and about one-fourth of a drop each of oil of fennel and anise.

It is not deemed necessary in this place to dwell much on the

medicinal qualities of calamus root; the above preparations are offered to physicians and pharmacutists merely to direct their attention to this grateful indigenous aromatic. While referring to the remarks of Prof. Wood, in the U. S. Dispensatory, it may probably not be amiss to quote from Pareira's *Materia Medica*, where the following language is used: "It is rarely employed by medical practitioners, though it might be frequently substituted, with good effect, for the more costly oriental aromatics. It is a useful adjunct to other stimulants and tonics. It has been employed in continuous asthenic fevers, accompanied with much prostration of strength, and greatly weakened digestive power. For the cure of the ague the dried root powdered is used by the country people in Norfolk. It is well adapted for dyspeptic cases, accompanied with, or dependent on, an atonic condition of the digestive organs, and is especially serviceable in gouty subjects. It has also been used as a local agent, viz.: in the formation of aromatic baths, poultices and gargles, as an application to foul-conditioned ulcers, &c."

In conclusion I give the recipe for *Calamus Toothpowder*, which has been successfully employed by Dr. Pitschaft in scorbutic or ulcerated affections of the gums and carious teeth.

Take of Calamus Root,	half an ounce,
Charcoal,	one drachm,
Castile Soap,	" "
Oil of Cloves,	twenty minims.

Rub them together into a very fine powder.

*Philadelphia, Jan., 1860.*

#### OPIUM AS A THERAPEUTIC AGENT.

By EDWARD R. SQUIBB, M. D.

Opium as an article of general commerce, in common with other articles of less importance, is judged and selected by inspection of its sensible properties. Whatever relation these sensible properties may bear to its medicinal value, they certainly are in no degree dependent upon the alkaloids it contains, for, neither in their natural nor artificial combinations do the more important alkaloids possess a single sensible quality or property in common with the opium from which they come, except



the bitter taste. Hence it must be apparent that the mere act of judgment applied to opium, can be of little other value than to discriminate by a certain physiognomy the class or commercial variety to which it may belong, and its freedom from unusual, or clumsy adulteration or admixture. Any one, therefore, with even a small experience in the assay of opium will give little credit to the assertion of opium judges, that by simple inspection of its physical properties they can tell within a fraction of one per cent., how much morphia any given specimen or case of opium contains.

Authorities agree pretty well upon the general fact that opium without any secondary adulteration varies in morphia strength from 2 to 22 per cent., in the different varieties met with in commerce. But, excluding from consideration here the lower grades, such as the Egyptian and India varieties, which may always be avoided by inspection, and the very high grades of European cultivated opium which are never met with in the common market, and thus confining these remarks to that variety almost exclusively met with in our markets, the following results have been obtained.

The Smyrna opium examined was of the qualities known commercially as "prime" and "strictly prime," and the number of critical assays made within the last six years, of which reliable notes were kept, and excluding those where there could be any suspicion of damage or sophistication, is ten. In all these the assay was confined to morphia alone, but the amount of water lost in drying sufficiently to powder the opium was also taken in many instances, and an average loss for the water was established. Upon this average loss of 21 per cent., the specimens of powdered opium examined were calculated back to their original condition of moisture, and the percentage is based upon the calculated weight for such specimens. Subsequent observations and a larger experience go to show, however, that this, as a general average, is a little too high; for although individual experiments with quantities of 10 to 20 lbs. will occasionally lose 24 and 25 per cent. in drying sufficiently to powder, other individual cases are met with where the loss is as low as 17 per cent. The average loss now supposed to be nearer the true expression, is, for drying 19.5 to 20 per cent., or in drying and

powdering 20 to 21 per cent., provided the powder be not exposed to attract moisture from the air after powdering. Then, as may be seen by the table, powdered opium contains as usually met with over 8 per cent. of moisture, or when carefully put up and well kept about 6.3 per cent. The amount of moisture in the powdered specimens was determined by exposing them to a temperature of 212° until they ceased to lose weight.

Quantity examined.	per centage of morphia.		per centage loss in drying.	
	in powdered opium.	in commercial opium.	in powdered opium.	in commercial opium.
Sample of powdered opium.	9.21	8.10	9.47	21. calculated.
" " "	8.55	7.37	8.34	" "
" " "	7.31	6.16	6.18	" "
" " "	7.44	6.26	6.10	" "
76 lbs. of opium.	9.32	7.87	6.31	20.967 actual.
1 " "		8.		
18 " "		7.77		23.343 "
2 " "		5.15		19. "
6 " "		8.32		19. "
1 " "		11.15		18. "

Within the extremes of this table there is a variation of 6 per cent. in the morphia strength, or admitting the quantity of morphia as an index of the therapeutic value of the opium, the dose being the same in all these instances, the therapeutic effect would be two and one-sixth times greater in one case than in the other, whilst in no two instances could it be exactly the same; and yet this table is, in itself, a mean between greater extremes, or at least is very far from the lowest extreme, since the writer has examined at least two specimens of powdered opium furnished by respectable sources that contained less than 1.5 per cent. of crude morphia.

The writer's observations lead directly to the conclusion that in every case of opium imported lumps could be found yielding at least all the variety of percentages of the above table, and therefore that there is no way of using opium therapeutically with a hope of even approximative uniformity in dose, except in the form of powder. And even in this form, when well made from large quantities, the ultimate extremes only are avoided.

If these conclusions be well based, the pharmacist who buys his opium one or two lumps at a time, and who may make his own powder from it, can never, except by accident, supply the physician with preparations of the same therapeutic power, for any great length of time.

Two circumstances in explanation of this great variation in the strength of opium, deduced from the writer's limited knowledge of the history of the drug, and not noticed in the works on *Materia Medica* within his reach, are, first, that the poppy, in common with other plants, must so exhaust the soil upon which it is cultivated year after year that its chemical products may vary and deteriorate in the ratio of this exhaustion. And secondly, that the opium reaches Smyrna in small lots from various sources, is there thrown together in heaps in the store-houses as it accumulates day after day during the season of transportation, and after inspection is boxed up indiscriminately from these heaps, so that any single case may in its various lumps represent a great variety of original locality, individual management, soil, and even climate.

Under such circumstances it must be true that no therapeutic applications of opium can be uniform in effects or results, and that it cannot therefore properly meet many of the indications to its use.

The remedy for this that naturally first presents itself, is a reliance upon the salts of morphia. But apart from the variability of effects noticed in the use of these salts as found in the market, most observers have found that there are certain good effects obtained, or certain unpleasant consequences avoided, more frequently by the use of the natural combination, while all agree that the whole therapeutic power and influence of opium cannot be obtained from any salt of morphia. Taking the whole profession of medicine of all countries in connection with this well known want of uniformity in the medicinal power of the drug, it is a remarkable and significant fact that so large a proportion of the profession adhere to it and to these preparations which most nearly represent it, for certain and very numerous purposes, in preference to salts of morphia, so that repeated and continued efforts are made to improve the class of preparations in which its natural condition is preserved, and one or two such preparations are found in habitual use in almost every nation or country. Some of the best of these have always been made by secret and proprietary formulæ, and are largely used even by the profession notwithstanding. It is not known, and perhaps not probable, that in any of these preparations any

attempt is made to correct the want of uniform strength of the drug, and indeed one at least of the most popular of these is rather remarkable for a want of uniformity in effect. But effort seems to have been chiefly directed first to preserve the natural condition and combination of the constituents; and secondly, to exclude certain inert matters and other constituents supposed to produce unpleasant effects. In France, however, there has been an effort recently made with the direct object of attaining uniformity of strength. A preparation has been introduced as "opium titré," made by mixing the contents of an entire case of opium into a magma with water, adjusting the strength of the whole to a given standard by abstracting insoluble inert matters from it, drying to a given consistence, and finally putting it up in stamped packages of fixed weight, enveloped in tin foil.

This method is liable to the grave objection that it is not generally applicable, but must be confined to the large manufacturer, since, to obtain good average results, large quantities must be operated upon.

To accomplish the desired object of uniformity in this important drug, and to introduce into pharmacy the principal of assayed solutions, the writer has constructed and practised a formula now to be given, which, from the limited trials to which the preparation has been put, encourages the hope that upon further application it may be found of sufficient importance to be admitted to the Pharmacopœia.

It is not proposed as an unobjectionable preparation, nor as one that meets all the desired indications, nor certainly not as a preparation that will either do or avoid what the best specimens of opium in substance would. But it is simply offered as a skillfully constructed preparation of uniform strength, wherein much of the inert and objectionable matter of the opium is avoided, and the sedative anodyne effect preserved in known and controllable quantity.

When opium is given in large doses it seems often to meet the indications to its use with a shock or concussion, and in proportion as the impression is profound and continued, and in proportion as it over-reaches the desired object, in the same proportion is the subsequent reaction, producing depression,

anorexia, nausea, headache, &c. Now in medicine as in mechanics, it would be fallacious to expect to control a reaction independent of control of the power producing it, and therefore the writer never supposed that any preparation of opium could be made to produce the full opiate effect without the corresponding reaction, but only hoped that by having a preparation of known and fixed power, the indications might, by proper graduation of dose, be just met and not over-reached, and that thus the rebound or reaction might be avoided in measure. In regard to this preparation thus far, there does seem to be force in this reasoning, and truth in the practice, that it does produce less profound narcotism, a sleep that has less of coma about it, and of a more normal character than the opium in substance or its tincture, and that the unpleasant after-effects are far less, both in quality and degree.

The combination with even so small a proportion of the compound spirit of ether as  $12\frac{1}{2}$  per cent. seems also to have a modifying influence which for a great majority of cases overbalances the disadvantages of the odor, taste, and even the injurious medicinal effect of this agent in a few instances. The combination, however, is one long and favorably known in the profession, and one to the value of which the writer can bear personal testimony. The quantity of the Hoffman's Anodyne introduced into the preparation is so guarded, as to be sufficient, as is supposed, to protect the watery solution from change by keeping, and at the same time not large enough to interfere with its use where anodynes are required in acute inflammatory affections.

---

LIQUOR OPII COMPOSITUS.

(*Compound Solution of Opium.*)

By EDWARD R. SQUIBB, M. D.

Take of Opium, sliced,	16 parts,
Compound Spirit of Ether,	a sufficient quantity.
Ether, fortior,	12 parts,
Alcohol,	112 parts,
Water,	a sufficient quantity.

Digest the opium with four times its weight of water for twenty-four hours, with occasional stirring during the first twelve



hours. Then having disintegrated it thoroughly with the hand, transfer it to a paper filter, and when it has drained, percolate the residue with sixteen parts of water. When it has again drained, transfer the residue, by portions of about two parts each at a time, to a piece of strong muslin, and wring out the liquid from it by strong expression with the hands. Return the liquid obtained by expression to the filter; break up the expressed residue, and having digested it again for twenty-four hours, with thirty-two parts of water, and with thorough working with the hands, transfer it again to the filter, drain it, percolate it with sixteen parts of water, and express by wringing, as before. Repeat this digestion, rubbing with the hands, percolation and expression with sixteen parts of water again twice, making four times in all.

Evaporate the filtrate by rapid boiling in a tared tinned vessel of the capacity of sixty-four parts, stirring constantly toward the close of the evaporation, until it weighs twelve parts. Then add to the concentrated solution in the vessel, forty-two parts of the alcohol, and having boiled the mixture for five minutes with constant stirring, set it aside in a cold place for an hour. Decant the liquid from the undissolved residue into a vessel of the capacity of one hundred parts, and repeat the boiling of the residue with alcohol three times, twice with twenty-eight parts and lastly with fourteen parts, allowing to each solution an hour to cool and deposit insoluble matters. Mix the alcoholic solutions as they accumulate, and allow the whole to stand twenty-four hours in a cold place.

Pour off the clear alcoholic solution from the deposit, and evaporate it by boiling, (or distil off the alcohol,) until the concentrated solution weighs ten parts. Agitate this in a bottle with six parts of the stronger ether, separate the ether by decantation, and repeat the washing with the remainder of the ether, and separate it in the same way. Throw the ethereal solution away, and dissolve the washed extract in water by agitation in a tared bottle, and having diluted the solution till it weighs eighty parts, agitate it occasionally during twenty-four hours, filter it through paper, and wash the filter with water till the solution weighs eighty-five parts. This solution is then to be assayed, to ascertain the proportion of morphia it contains, as follows :

*The Process of Assay.*

Take of Solution of Opium,	464 grains,
Alcohol,	380 "
Solution of Ammonia,	22 "

Weigh the solution of opium in a carefully tared capsule, of a capacity of about three ounces, add to it one half of the alcohol and stir the mixture. Add the solution of ammonia to the other half of the alcohol in a separate vessel, mix them, add the mixture to the contents of the capsule, stir the whole together and set it aside for twenty-four hours, protected from dust but not covered. Decant the clear liquid carefully and slowly off from the crystalline deposit and dry the crystals in the capsule, at a temperature of  $212^{\circ}$  for half an hour. Finally cool the capsule and contents, weigh them closely and subtract the weight of the capsule. The remainder is assumed for the weight of the morphia.

Multiply the weight of the morphia by seventy-nine and divide the product by four. Then multiply the quotient by four hundred and fifty-five, and divide this product by four hundred and fifty. The last quotient will be the number of parts by weight to which the solution must be made up in finishing it; and this quotient divided by eight will give another quotient indicating the number of parts by weight of compound spirit of ether to be added to the solution in finishing it.

*The Dilution or Finishing.*

Finally, upon the result of the assay, add to the solution of opium the proportion of compound spirit of ether indicated, agitate the mixture well, add a quantity of water sufficient to make up the required weight, shake the whole well together, digest with frequent shaking for one week, and filter through paper.

Each fluid ounce (of four hundred and fifty grains) of this solution contains four grains of morphia, (equivalent to 5.33 grs. of sulphate of morphia,) and fifty-six grains of compound spirit of ether, and is of the same morphia strength as the official tincture of opium, provided the powdered opium from which the tincture is made contains precisely ten per cent. of morphia. In sedative effect, however, it is less active. Compound solution of opium is a dark wine-colored liquid, but not so dark as tinc-

ture of opium. It has a fragrant ethereal odor, but is almost devoid of opium odor, and has a bitter taste. It is acid to litmus paper, and forms a copious precipitate with ammonia and with alkaline carbonates. Its s. g. is .995. When slowly evaporated to one half its volume, and subjected to the process of assay by which it is adjusted, it yields 0.88 per cent. of morphia.

In order to exhaust opium thoroughly some little skill is required. It is best not to work it with the hands at first, but by simple stirring and keeping it loose, to favor more rapid disintegration. It is best to use a large proportion of water at first as directed, because the opium is thus far more perfectly exhausted by the first maceration, and the succeeding maceration rendered more effectual. By very skilful management the object may be attained with less water. But it is safer, and more applicable to all degrees of dryness of the drug, to use the full quantity and manipulation directed. The percolations upon a filter very much facilitate the exhaustion, and these to be effective must be performed continuously. That is, the residue must not be allowed to drain so close as to contract and become impacted before the whole of the water has been poured on, for when it contracts and separates from the sides of the filter the percolation is very imperfect. If the residue be removed from the filter carefully, and the funnel containing the filter be covered with a wet cloth, the same filter will serve for the entire process. But if the filter be exposed to the air and be allowed to dry, it becomes almost impervious, so that a new one is required for each maceration. The expressing the residue can only be well accomplished by taking small portions at a time, and making them—not into a round ball in the cloth—but into a long mass, not thicker than two fingers, and then wringing this strongly in the cloth. When a press is used the resinous matter and coutchouc are pressed into or through the meshes of the cloth so as to render the cloth nearly impervious, while the liquid is entrapped within. No method of expression ever tried by the writer succeeds so well as the somewhat tedious and laborious one indicated.

The insoluble residue of this step of the process, when dried at a moderate temperature, varies between 30 and 35 per cent. in well selected opium.

The solution thus obtained, when thoroughly mixed and assayed, yields but a small fraction of one per cent. more of morphia than the solution when finished, whilst the morphia obtained from it is more difficult to purify. This solution may be boiled down as rapidly as it is possible to boil it without loss by splashing, without the slightest injury to the morphia salts, provided the evaporation be not carried beyond the point indicated, and provided the stirring be effectually performed during the last part of the evaporation. The residue is in the form of a thin extract. If this be placed now upon a water bath and evaporated to dryness, it is easily rubbed into a dingy yellowish brown powder, which weighs from 43 to 46 per cent. of the opium.

It is, however, not only unnecessary, but injudicious, to evaporate it to dryness, because the risk of injury to the preparation is greatest during such a proceeding, and at the same time the subsequent exhausting with alcohol is rendered more difficult, while it does not materially increase the proportion of matters rejected by the alcohol. By using a tared tin saucepan, for instance, these steps of the process are conveniently and easily managed.

The first portion of alcohol boiled upon this extract takes up a large proportion of the active matter, and also dissolves a portion of matter which is slowly deposited in cooling. If the time directed be allowed, much of this latter will be deposited upon the vessel in a gummy, adherent coat, so that the tincture may be poured off nearly clear to the last drops, without disturbing it. Any attempt to filter the tinctures is injudicious, because, before the deposition is complete, it would be defeated by clogging of the paper, and after the deposition is complete it would be useless. The residue becomes thicker, blacker, and more tenacious after each boiling with the alcohol, and finally, when exhausted, concretes on cooling into a hard brittle mass, of a dull black color and somewhat granular character, very soluble in water and very bitter. The bottom of the vessel in which the alcoholic solution is collected during this step of the process is also found, after the twenty-four hours directed, covered with a thick stratum of this black matter, whilst the supernatant tincture is by this time perfectly clear. These residues rejected

by the alcohol, when collected and dried, weigh about 14 per cent. of the opium, or about 31 per cent. of the dry watery extract. The alcohol may be recovered from the tincture by distillation, if operating with quantities that will warrant it, otherwise it may be driven off by rapid evaporation and boiling till the required weight is obtained. This residue is again in the form of a thin extract, and should be poured while warm into a bottle, because, while warm, less of it will adhere to the evaporating vessel. It is then to be cooled before adding the first portion of ether, and the ether is first washed round the evaporating vessel for the purpose of washing the small portion that adheres to it. The ether commonly becomes only slightly colored, but in the character and amount of matter removed by it varies very much in every instance in which the writer has applied it.

Upon spontaneous evaporation this ether leaves at times only a small portion of dark colored extractive matter, soluble in alcohol and water and of a bitter taste; at other times it yields a crystalline crust upon the vessel; and again it yields an oily matter which dries only by prolonged exposure, or rather by a process of oxidation. Sometimes the residue has that peculiar nauseous odor which is more faintly noticed in the opium, but at other times it is almost free from odor. In perhaps two or three of the six times the writer has used the washing with ether, it has appeared to be of but little use, because the matters removed from it were so very trifling. But in the other cases it was so decidedly useful that it is regarded as an important step toward uniformity of result. For its use in the process the writer is indebted to the suggestion of Prof. Procter, who used it in his formula for a similar preparation, published in this Journal some years ago.

In dissolving the washed extract in water much care is necessary to avoid loss. It should be transferred to a tared vessel capable of holding it when diluted, and all the vessels well rinsed with the water for dilution. Upon dilution a copious light flocculent precipitate of a light brown color is thrown down, which when separated by filtration and dried weighs about 1.2 per cent. of the opium. All these solutions, from first to last, are strongly acid to litmus paper, showing probably that the bimeconate of morphia has suffered no decomposition or loss of



its active soluble character, and that the salt is of a very fixed nature.

The writer performed parallel experiments with these solutions, in which a similar part of the same solution was in one case boiled down rapidly over a naked flame, and in the other was evaporated at a low temperature by a vapor bath. An assay of the resulting preparations exhibited no material difference in the morphia strength, while the preparation made by rapid boiling was much less loaded with coloring matter, and had a lighter specific gravity. Other experiments were made wherein the extract was dried and powdered each time, and was in one case repeatedly redissolved and evaporated to dryness, with the view of completely oxidising the resinoid matters to render them insoluble, but it was evident that no advantage was gained. From these experiments, although made with different parcels of the drug, it is easy to get up what may be a useful rational formula for the commercial drug in its best form.

Exhausted residue, not thoroughly dried,	31 per cent.,
Watery extract,                   "                   "	48   "
Water,	26   "

---

100

The best specimen of opium the writer has ever examined was the single pound quoted in the table of the preceding paper. It consisted of

Imperfectly dried residue,	30.7 per cent.,
"                   "                   aqueous extract,	45.5   "
Water,	23.8   "

---

100

The aqueous extract of this specimen consists of

Imperfectly dried extract insoluble in alcohol,	30 per cent.,
"                   "                   "                   in water the	
second time.	1.2   "
Morphia,	35.8   "
Coloring matter and other constituents soluble	
both in alcohol and water, and insoluble in	
ether,	33   "

---

100

It is well known that the natural salts of morphia and one or two of the other alkaloids of opium are soluble both in water and in alcohol, whilst a large proportion of the inert and objectionable matters are rejected by each of these menstrua; and upon these circumstances are based the supposed advantages of this process. The water as a menstruum rejects the resin, lignin, earthy matters, leaves, seeds, &c., and, used cold, rejects almost all the narcotine not combined as a soluble salt, and one or two other constituents in great measure. The alcohol rejects from the watery extract the gum, bassorin, albumen, and some extractive matters, all of which if left in would tend to ferment and change the character of the preparation in keeping, whilst the ether washing removes the oily or fatty matters, some of the codeia and other matters. Thus depurated, and especially when a small proportion of the compound spirit of ether is added, there is no good reason why the preparation should not keep indefinitely.

The application of a process of assay to this preparation, however desirable in view of uniformity of result, has, nevertheless, so many disadvantages in its application to Pharmacy in general, that it is very doubtful whether its use will accomplish the purpose. The practical difficulties in this step are not apparent at sight; for it appears that when reduced to absolute mathematical expression, and when a simple, easy process of management is described in what may seem to be superabundant detail, there could be little possibility of inaccuracy. Yet to any one not practised in such processes, the difficulty of getting the assays to agree in result will be rather surprising and discouraging, and the skill to be acquired before absolute results are attainable will require the exercise of thorough honesty of purpose and industry of pursuit. It is nevertheless absolutely certain, that by perseverance and industry reliable results can be obtained, and that there are a large number of pharmacutists who by education and experience are well qualified to perform such assays. When using the process for the first time, however, it is not proper for any one to depend upon the result of a single assay as directed in the process. Three, at least, should be made, and the results in two of the three should agree within  $\frac{1}{2}$  of a grain, and the mean of these two should be adopted. Indeed,

it will generally be safest to perform two assays, because from the heterogeneous and varying character of opium, the process of morphimetry is rather unusually difficult. The method of assay adopted is not the most accurate one, and always gives results a little too high, though the amount of narcotine coloring matter, &c., weighed as morphia, is nearly counterbalanced by the portion of morphia held by the mother liquor. It is, however, beyond all measure the most simple and the most easy, and most susceptible of a definite practical description, while it is sufficiently accurate to accomplish in great measure the object of uniformity. Through some disturbing influence of the ether and oil of wine the finished solution is much more difficult to assay by the same process. The solution requires to be evaporated at a low temperature for twenty-four hours before the attempt to precipitate it.

The management directed in the assay, by which the alcohol added is divided, and one-half mixed with the ammonia, is necessary in order that the morphia shall be slowly precipitated in the form of dense crystals, and these be tolerably free from coloring matter; and the slowness with which it is deposited makes it necessary that the full time directed be given to this step. Then the morphia is almost all crystallized out, and is in such a form that the mother liquor may be poured off from it generally to the last drop without disturbing the crystals, and thus the complication of a filter is avoided. The capsule used should be shallow, and should not be covered during the time of depositing the morphia, because solutions of ammonia are very variable in strength; and if an excess of ammonia be used within certain limits, it will pass off during twenty-four hours' exposure, and allow the morphia to be deposited more perfectly. The drying and weighing of the contents of the capsule, while still undisturbed within it, is easily performed, and avoids sources of loss and error. The four hundred and sixty-four grains of the solution directed for the assay is exactly one fluid ounce, and the eighty-five parts directed as the standard of dilution for the solution before assaying is exactly equal to eighty parts by measure; that is, eighty-five avoirdupois ounces of the solution measures exactly eighty fluid ounces. One fluid ounce, then, having been taken for assay, leaves seventy-nine fluid ounces or

parts by measure. Hence the weight for morphia, obtained by the assay multiplied by 79, gives the whole weight of morphia in the solution; and this whole weight of morphia in the solution divided by 4, gives the number of fluid parts,—parts by measure,—or say, for example, fluid ounces—of four grains of morphia each to which the solution must be finally diluted in finishing it. Now, as a fluid ounce of distilled water weighs 455 grains, (disregarding the fractions,) and as a fluid ounce of the finished solution weighs only 450 grains, it becomes necessary to multiply the number of parts to which the solution is to be reduced or diluted in finishing by 455, and then to divide the product by 450, to get the number of parts by weight to which it must be diluted in the finishing. Then, as 12.5 per cent., or one-eighth of its weight, is the proportion of Hoffman's anodyne fixed upon for the constant quantity, if the last quotient or whole number of parts be divided by 8, this will of course indicate the number of parts by weight of Hoffman's anodyne required.

The finishing is then simply the addition of the 12.5 per cent. of Hoffman's anodyne, and the making up the weight with water. The apparently rather complicated calculation is simple enough when once understood. It is rendered necessary in order that the solution may be made by weight, and be dispensed by measure; and this dispensing by variable and incorrect measures is then the only source of inaccuracy in the practice with it.

When the Hoffman's anodyne is added to the solution, a large part of the heavy oil of wine is precipitated by the abstraction of its solvents. By subsequent digestion and agitation, however, this appears to be in great measure redissolved or combined, so that in one experiment where many weeks were allowed to the frequent shaking, it all disappeared from the surface except just sufficient to form a ring on the bottle at the surface of the liquid. During this digestion and shaking as directed a small portion of very light flocculent matter is precipitated, so that for the removal of this and the small proportion of undissolved oil the ultimate filtration is directed, and a bright, clear liquid is the result.

Each fluid ounce of this solution (weighing 450 grains) con-

tains 4 grains, or very nearly that amount of the pure alkaloid morphia, and probably contains very little of the other active matters of the opium. Four grains of morphia is about equivalent to 5.33 grains of sulphate of morphia, according to the formula  $\text{Mo SO}_3 + 6\text{HO}$ , for that salt, and therefore each fluid drachm should be equal to .66, or two-thirds of a grain of sulphate of morphia. Each fluid ounce contains, by actual experiment from an ordinary one ounce vial, 448 to 450 drops, (so that in the case of the solution a drop is very nearly a grain,) and therefore eighty-two drops should be equal to one grain of sulphate of morphia. But in actual practice with the preparation the effect seems to be somewhat less, and has been estimated at one hundred drops for one grain of the best sulphate of morphia. The ordinary sedative dose, where no great amount of pain or irritation is to be combatted, is twenty drops, equal to one-fifth of a grain of the morphia salt. In such doses it sometimes produces tranquillity, and a pleasant calmness and repose, but not sleep. In such cases ten or fifteen drops more finishes or completes the effect when sleep is desirable. In a large class of cases an increase of the proportion of Hoffmann's anodyne appears to be useful.

In comparison with good powdered opium and laudanum it seems to be still further behind them in power, in proportion to the amount of the drug represented and really present in it. If the powdered opium contains, as it should, 10 per cent. of morphia, equal to 12.5 per cent. of sulphate, then 12.5 drops of this solution should represent one grain of the powdered opium. Whilst in actual practice, nearly double that quantity is required to produce the effect in ordinary cases; whilst in such affections as delirium tremens, in one instance two grains of powdered opium succeeded in procuring sleep after one hundred drops of the solution had failed. Indeed it does not appear to be at all adapted to fulfil the indications to the heroic use of opium, and probably the opium is as little adapted to the cases or circumstances to which the solution is most applicable; and the difficulty of producing profound narcotism with this solution in due proportion to the amount of morphia it contains, in comparison with either opium or salts of morphia, is not easy to explain. If this discrepancy be established as a fact upon more numerous



and prolonged observations, it will be a curious one in the therapeutic application of the drug.

The preparation has now been in common use nearly four months, and rather extensively used in two of the largest hospitals here; and upon these limited observations the above statements are based,—the observations having been apparently made with care.

*New York, Feb., 1860.*

---

#### CRITICISM ON THE PLURAL OF FORMULA.

*Mr. Editor,*—My attention has often been attracted, in reading your own and other scientific journals, to the mode of employing the plural of the Latin word *Formula*, as exhibited in the communications of the different contributors. Most of them designate the plural both in the nominative and objective cases by changing the final *a* into *æ*; as, *formula*, *formulæ*. For instance, the expressions, “adopted for the *formulæ*,” and “the *formulæ* are expressed,” occur in recent numbers,—the former being in the objective, the latter in the nominative case. The word “*formula*” is either a Latin word, and to be used as such, or it is an adopted English one, and therefore amenable to the common rules of termination. If we recognize it as belonging to our tongue by adoption, then it must follow the analogies of Greek and Latin words, which lose their original endings, and form the plural by adding an *s* to the singular, when they are transferred to the English dictionaries. If, on the other hand, it remains a Latin word, it must accord with the Latin grammar. In Ainsworth’s Dictionary it is stated to be of the feminine gender, thus making the nominative and accusative cases, plural, to be “*formulæ*” and “*formulas*” respectively. Consequently, whenever the word “*formulæ*” occurs, as if in the objective case, it is incorrect according to both languages, and should be written “*formulas*.”

How much better then to throw off this false Latinity, and adopt *formula*, at once, as an English word, with a plain, simple, and euphonious termination in *s* for the plural. We adopt this plan for other words. None of us would say “in four European

Pharmacopœiæ," lest our lingual organs should suffer. I am sure the "formulas" furnished by your journal, will have a good chance for adoption.

Respectfully,

MEDICUS.

---

ON AMERICAN POT AND PEARL ASHES.

By FERDINAND F. MAYER, of New York.

The last number of Wittstein's *Vierteljahresschrift* (Band ix. 1) contains a paper on adulterated ashes, from D. A. Van Bastelaer, (taken from the *Journal de Pharmacie d'Anvers*, 1859, xv. 172,) which deserves at least a passing notice, as it throws out some serious doubts as to the quality and undisputed superiority of American ashes.

Mr. Van Bastelaer gives the results of an analysis of five different pot and pearl ashes, three of which are of reputed American origin, one Russian, and another of Continental make. They are principally remarkable for the large proportion of *carbonate of soda*, which in the three American specimens stands respectively as 21.14 to 18.76—21.97 to 29.73—15.69 to 28.11 of carbonate and hydrate of potassa, while in the Russian as 11.16 to 36.04.

That this large amount of soda is owing to adulteration when it amounts to one-half of the active ingredients, is not to be doubted. But *where* the falsification takes place, is another question; and I think that the subjoined analysis of ashes, taken indiscriminately out of two leading yards at this port, will prove to some extent that the adulteration was not practised here.

I. *First sort Potash*—the inside of a cask, nearly white and of crystalline texture.

II. *First sort Potash*—the outside of another cask, dark, and contains some sulphuret.

III. *Second sort Potash*—dark grey, with a considerable portion of insoluble matter (carbonate and sulphate of lime.)

IV. *First sort Pearlash.*

V. *Second sort Pearlash.*

VI. *Third sort Pearlash.*

	I.	II.	III.	IV.	V.	VI.
Carbonate of Potassa	43.68	24.57	15.07	56.01*	53.15	38.47
Hydrate of Potassa	49.68	44.43	38.69	5.61	4.49	
Sulphate of Potassa	4.07	16.14	19.76	27.70	21.30	53.34†
Chloride of Sodium	1.64	4.40	6.60	10.49	5.37	0.62
Carbonate of Soda		4.27	4.70		14.01	6.03
Insoluble matter, etc.	0.72	6.19	15.86	0.19	1.69	1.54

I have not been able to ascertain the origin of No. V., in order to get a clue as to the considerable proportion of soda; but I shall follow up the matter, and probably be able to trace back articles of that description to their place of make.

36 Beekman St., New York, Feb. 16, 1860.

## NOTE ON KAVAÏNE AND METHYSTICINE.

BY THE EDITOR.

The substance which constitutes the subject of this notice is derived from the plant described as *Piper methysticum*,—the “Cava” of Capt. Cook and the “Kava” of other writers and observers of the productions of the South Sea Islands. The root is both chewed and made into a drink, with a view to its exhilarating effects on the nervous system. The process of making cava as a beverage is described graphically by Mariner in his *History of the Tonga Islands*, and is quoted by Mr. Morson in a notice published at page 474, vol. 3, of the *Pharmaceutical Journal*. Recently Dr. S. Weir Mitchell presented us with a specimen marked “Kavaïne” which he had received from Dr. Trist, of the U. S. Navy, who obtained it at Tahiti from a French apothecary at that place, and who had made it from the kava. We were about to make an examination of this substance when the *Journal de Pharmacie* for January, 1860, came to hand, in which M. Gobley has published some researches on the “Kawa” root and its chemical constituents, among which, under the name of *Methysticine*, he describes a crystalline substance which we at first supposed to be the “Kavaïne” of Dr. Trist.

Methysticine is in colorless white and silky needles, has neither

\* Contains 1.5 per cent. of silicic acid.

† Contains some sulphate of soda.

odor nor taste nor reaction with litmus, and fuses at  $266^{\circ}\text{F}$ . decomposed at a higher temperature. It is insoluble in water, and but little soluble in alcohol and ether and in hot volatile oils. Its best solvent is boiling alcohol, from which it separates by cooling in crystals. It is soluble in hydrochloric acid with a yellow color. Nitric acid dissolves it with first a yellow and then an orange color without turning red. Pure  $\text{SO}^3$  is colored by it beautifully violet, whilst commercial oil of vitriol assumes a deep red coloration.

M. Goble at first supposed this substance to be piperin, with which it is analogous; but it differs from piperin, 1st, in its crystalline form; 2d, in its fusing point; 3d, by the reaction of  $\text{NO}^5$  and  $\text{SO}^3$ ; and lastly, by its composition, which is as follows:—

Carbon	-	-	-	-	-	62.03
Hydrogen	-	-	-	-	-	6.10
Nitrogen	-	-	-	-	-	1.12
Oxygen	-	-	-	-	-	30.75
						<hr/>
						100.00

The specimen of Kavaïne from Dr. Mitchell is in beautifully white and brilliant prisms, *soluble* in water, nearly insoluble in alcohol; are insoluble in ether, soluble in concentrated nitric acid without reaction or coloration; soluble in sulphuric acid, and, when heated, the solution acquires a brownish color. It fuses when heated, first losing its transparence, and with further heat yields a voluminous charcoal, and finally an alkaline ash. It is neutral to test papers, has little taste and no odor. From these facts it is evidently a different substance from methysticin, possibly an organic salt. We propose at a leisure moment to examine it more closely.

M. Goble also isolated from kava a soft resin, which is soluble in alcohol, and remains in the mother liquids, from which methysticine is crystallized. Its color is greenish yellow; its odor aromatic; its taste acrid and biting, and excites salivation. It fuses at  $122^{\circ}\text{F}$ ., is insoluble in water and soluble in alcohol and ether, and communicates to  $\text{SO}^3$  an intense red color like pepper resin. M. Goble believes that the physiological effects of kava

are attributable to this constituent. Besides these two substances, *cellulose*, *starch*, gum and various salts were found.

Dr. O'Rocke, who sent the kava to M. Goble, says that it has a decided therapeutic action, and is one of the most powerful sudorifics that he was acquainted with, and also has a direction to the mucous surfaces, as do other varieties of the pepper tribe.

---

#### GLEANINGS FROM THE GERMAN JOURNALS.

By JNO. M. MAISCH.

*Extract. nuc. vom. alc.*—When kept in powder, it soon becomes a tough mass. This change may be effectually prevented by adding towards the close of evaporation a little water, and then continue to evaporate to dryness.—Zippel, in *Archiv d. Pharm.*, 1859, July, 24.

*Drying upon brick tiles* is recommended by Zippel for most precipitates. Hydrated oxide of iron dries in a few hours. White precipitates, like nitrate of bismuth, are obtained of a beautiful whiteness; highly-colored precipitates, however, are rendered paler. A double layer of bibulous paper is recommended to be placed upon the tile. Sulphate and carbonate of soda may be readily exsiccated by hanging them, enclosed in a bag, in a draft of air.

*The seeds of Helianthus annuus* have been analyzed by A. Kromayer and Prof. Dr. Ludwig, of Jena, who found them to contain,—1. Helianthic acid,  $\text{HO}, \text{C}_{14} \text{H}_8 \text{O}_7$ , a tannin, which is not precipitated by gelatin, but precipitated by sesquisalts of iron with a dark green color: it is not identical with Rochleder's caffeotannic acid of the same formula. 2. Fixed oil, nearly 40 per ct. 3. Fermentable sugar, a small proportion. 4. A body soluble in alcohol, precipitated syrupy by ether, not directly fermentable; on boiling it deoxidizes oxide of copper. 5. Legumin. 6. A body insoluble in water and alcohol, deoxidizing  $\text{CuO}$  to  $\text{Cu}_2\text{O}$  when boiled with diluted acids (inulin?). 7. Mul-



der's horn-like vegetable albumen (resembling cellulose, soluble in conc.  $\text{SO}_3$ , precipitated by  $\text{HO}$ ). 8. A compound of helianthic acid with a protein-like body. It is a saponaceous mass, swelling up with water, coagulated by acids, soluble in hot alcohol. The authors suppose that most so-called vegetable albumen consists of a protein body combined with a tannic acid (so-called extractive matter.)

9. Cellulose. The seeds yield 4.194 per cent. ashes, consisting of phosphate of potassa, chloride of potassium, phosphate of lime and of magnesia, and minute portions of sulphuric acid.—*Archiv d. Pharm.*, July, 1859, 1-18; Sept., 285-288.

*Test for minute quantities of soluble iodides*, by C. W. Hempel.—To the liquid contained in a thin, white glass tube, some sesquichloride of iron and sulphuric acid is added until the mixture is colorless. A small portion of starch paste is mixed with it and allowed to settle. The starch assumes a more or less reddish color; .0000001 iodine in .5 CC. water still produce a pale rose color. Chloroform may be substituted for the starch; it yields a colored solution if iodine is present. If the iron-salt is replaced by bichloride of platinum, the reaction is still more striking, the chloroform being colored not only by free iodine, but also by finely-divided protiodide of platinum in a finely-divided state. If chloride of palladium is employed, the coloration is occasioned solely by iodide of palladium, which by some agitation readily rises to the surface of the chloroform, there forming a colored stratum. Bichloride of platinum is the best test for iodine in mineral waters, which, on account of the organic matter, had to be acidulated with muriatic acid.—*Ann. d. Chem. and Pharm.* xxix. 260-262, xxxi. 102-110.

*Decomposition of urea by nitrites*.—Prof. Ludwig and A. Kromayer have found (*Archiv d. Pharm.* 1859, Oct. 1-11) that nitrite of lead and nitrite of mercury decompose urea in the presence of free nitric acid, not into carbonic acid and nitrogen, as has been asserted by Millon and Neubauer, but into carbonic acid, nitrogen and ammonia, as follows:— $\text{C}_2\text{H}_4\text{N}_2\text{O}_2 + \text{NO}_3 + \text{HO}, \text{NO}_5 = \text{C}_2\text{O}_4 + 2\text{N} + \text{NH}_4\text{O}, \text{NO}_5 + \text{HO}$ . Liebig and Wöhler obtained these results as early as 1838.

*Determination of nicotia in tobacco.*—Schiel proposes in Ann. der Chem. and Pharm., xxix. 257, 258, the following apparatus: Two strong, narrow-mouthed bottles are connected by a glass tube, reaching in one to the bottom, where it is covered with some linen acting as a strainer; in the other, just below the cork. The first bottle contains the cut tobacco, which is macerated with ammoniacal ether. The corks are secured with string. When sufficiently macerated, the first bottle is immersed in warm, the second in cold water, whereby the vapor of the ether forces the ethereal solution of nicotia into the second bottle. By changing the bottles, the ether distils back into the first bottle, leaving nicotia behind. This process is repeated until the tobacco is exhausted.

---

#### ON A NEW TEST FOR VEGETABLE ALKALOIDS.

By F. SCHULZE, of Rostock.

The acid mixture, obtained by dropping pentachloride of antimony into a solution of phosphoric acid, yields precipitates with ammonia and most of the alkaloids, and may be regarded as a new and reliable test for these organic compounds. Most of the precipitates are of a whitish color; a few, however, are decidedly colored and characteristic in this respect. A solution of one part of muriate of brucia, dissolved in 1000 parts of water, is precipitated by a few drops of the above test liquid with a beautiful rose color. The precipitate dissolves on heating, but separates again on cooling more bulky than before, and the liquid has now an intense carmine color. Dissolved in 10,000 parts of water, brucia yields a little flesh-colored precipitate, which increases in bulk after boiling. The coloration is of great stability.

The author promises further researches on the composition and properties of the precipitates, and the applicability of the test for forensic analyses. The following embraces his observations on the delicacy of the reagent:—

Strychnia: 1-1000th nitrate of strychnia, yellowish-white, curdy; 1-5000th whitish flocculent; 1-25000th slight turbidity.

Quinia: 1-1000th flocculent, somewhat lighter than strychnia; 1-5000th opalescent turbidity.

Cinchonia: 1-1000th bluish-white floccules; 1-5000th very faint turbidity.

Veratria: 1-1000th dirty-white floccules; 1-5000th opalescent turbid.

Narcotina: 1-1000th considerable yellowish-white flocculent precipitate; 1-5000th strong turbidity; 1-25000th slightly turbid.

Morphia: no reaction in solution of 1000 parts of water.

Codeina: 1-1000th strongly turbid, dirty white.

Nicotina: 1-250th slightly turbid.

Piperina: yellow precipitate, even when pretty largely diluted.

Atropia: 1-1000th white precipitate, which, when heated, at first dissolves in the liquid, but separates and increases on continued boiling, and is then insoluble in much water; 1-5000th slight turbidity, increasing by continued boiling.

Aconitia: 1-1000th white precipitate; 1-5000th strong turbidity; 1-25000th slight opalescence.

Caffeina: 1-000th no reaction.

Theobromina: 1-1000th slightly turbid.

Digitalin: 1-1000th turbidity, disappearing on boiling, but reappearing on continuing the heat, when a considerable precipitate is thrown down.

It appears that for most alkaloids Sonnenschein's phosphor molybdic acid is a more delicate test; but it is surpassed in some instances, like atropia, &c., by Schulze's new reagent.—*Ann. d. Chem. and Pharm.* cix. 177. *Buchner's N. Repert.*, 1859, 421-423.

J. M. M.

# CHEMICAL RESEARCHES ON THE ESSENTIAL OIL OF VALERIAN.

By M. PIERLOT, Pharmacien.\*

In a note presented to the Academy of Sciences, the author

---

\* Pharmaceutists long ago found out an easier and cheaper way of making valerianic acid than distilling it from the root; but the other products have an interest, especially as one has been recommended for admission to our already encumbered *Materia Medica*.—ED. CHEM. NEWS.

had already demonstrated the pre-existence of valerianic acid in fresh valerian root, and had shown the uselessness of the means recommended for developing it in the oil extracted from the plant. He has since examined the oil to discover what principles it contains, and to establish by new experiments that not one of them is capable of becoming transformed into valerianic acid.

The oil of valerian has been made the subject of investigation by several chemists. Among others, Grote, who discovered valerianic acid; Ettling and Kraps, who supposed it to have the same composition as oil of turpentine; Gerhardt and Cahours, who detected in it an oxygenated oil and a hydrocarbon. Lastly, in the seventh volume of the *Annales de Chimie et de Physique*, 1843, Gerhardt published an important article on the subject, and his conclusions have been generally adopted in all recent works on chemistry. In this remarkable work, the author points out some capital errors.

As well as the acid, some chemists have denied the pre-existence of the oil in the plant. According to the partisans of this opinion, the oil is formed secondarily in the same way as oil of bitter almonds. Some experimenters allowing the free access of air, evidently could not obtain the volatile principle. M. Bouchardat having distilled the tincture of the dried root, found neither oil nor acid. The root exhausted by alcohol, treated again with water, and again distilled, furnished none; and hence the learned professor concluded that, as these principles had not passed over with the alcohol in which they were soluble, and could not be found in the water, they did not exist in the plant.

The fallacy of the first experiment is seen at once. Alcohol is entirely evaporated at  $78^{\circ}$  C., while the acid in solution requires  $110^{\circ}$ , and the oil  $120^{\circ}$  degrees; and therefore the alcohol passes over leaving these bodies in the residue, where they must be sought for.

That the oil does pre-exist in the plant is proved by the following experiments:—

If one of the radicles is simply crushed on a piece of white bibulous paper, an oily spot is produced.

The distillation of the fresh root with water gives an oil varying in color, according to the sort of plant used. It is green

when obtained from the wild valerian, and yellow when got from the cultivated plant. From whichever obtained, however, its characters do not sensibly differ in other respects. It is very fluid, and gives off a strong penetrating odor like that of the root; its taste is disagreeable, and a little sour; its specific gravity at  $10^{\circ}\text{C.} = 0.936$ . It reddens litmus paper strongly. Exposure to the air removes the greater part of its hydro-carbon, and some of the valerianic acid and water it contains; at the same time the oxygenated oil thickens and is converted into a green resin.

The oil boils at  $200^{\circ}\text{C.}$  A temperature of  $-40^{\circ}$  does not congeal it; but about  $-150^{\circ}$  white flocculi form, and rise to the surface, which, when removed, change to an oily liquid, having the odor of valerianic acid, of which the flocculi are composed.

The oil of valerian does not combine with either caustic potassa or soda.

Cold nitric acid colors it blue; if the mixture be slightly heated, nitrous vapors are disengaged, and at the same time the oil is changed into a blue resin, which is heavier than water, soluble in ether, insoluble in alcohol and caustic potassa, agreeing in these respects with the resin obtained by distilling the oil, and that extracted from the dried root.

When submitted to a simple distillation, the fresh oil gives at from  $120^{\circ}$  to  $200^{\circ}\text{C.}$  a yellow, oily, limpid, transparent liquid, which is only the oil a little impaired by the operation. This product contains nearly all the acid of the oil; its color becomes deeper by keeping.

If the heat be raised to from  $200^{\circ}$  to  $300^{\circ}$ , a limpid transparent oil of a bottle-green color is obtained, which is sensibly acid. Exposure to the air, as well as excessive distillations, transforms it into a green resin; nitric acid, on the contrary, converts it into a blue resin.

If, after removing the product of this second fractionation, the heat be continued to from  $300^{\circ}$  to  $400^{\circ}$ , a thick, oily, opaque substance of a greenish color passes over, containing traces of acid. This is completely changed into resin of valerian by the action of nitric acid.

The two last products, green and blue, mixed and distilled



together, give between  $200^{\circ}$  and  $280^{\circ}$ , a very fluid, transparent, slightly green, oily body, smelling like hay or the camphor of the labiateæ: this is the *valerol* of Gerhardt. It contains still a little acid. Redistillation renders it colorless, and makes the odor softer and sweeter. Gerhardt calls this *neutral rectified valerol*. It is important to remark that it can only be really rectified by distilling it in contact with a strong base, which will remove the acid it always contains. In this way only we obtain a neutral product which no influence will change into valerianic acid.

During the last distillation, between  $200^{\circ}$  and  $280^{\circ}$ , there condenses in the retort tube a crystalline volatile matter smelling like camphor: this is the steareoptene of valerian to which we shall presently return.

Such are the different bodies obtained from the oil, simply by means of heat, and we see that valerianic acid is always present, and is found even in the last products of decomposition.

If now we distil the freshly prepared oil off solid potassa, in a tubulated retort furnished with a thermometer, gradually increasing the heat up to  $200^{\circ}$ , there passes an almost colorless oil, which smells something like oil of turpentine. At  $200^{\circ}$  the distillation stops spontaneously. Some aqueous vapor is disengaged, and the oxygenated oil retained by the potassa concretes, and assumes an odor like camphor. The result of this first distillation is the hydrocarbon ( $C_{20}H_{16}$ ) contained in the oil. In this operation, which I have often repeated, I have never observed the crystalline matter which Gerhardt sometimes met with; it is only above  $210^{\circ}$  and at the expense of the oxygenated oil that this body is produced, as we shall see further on. Gerhardt gave the name *borneene* to the hydrocarbon, but I prefer to call it *valerene*. When it is pure it boils at  $160^{\circ}$ , and evaporates without leaving a residue.

The valerianic acid originally contained in the oil is combined with the potassa; but the oxygenated oil has by no means produced it, as Gerhardt wishes to show.

If now, after having changed the receiver, we continue to heat the oil which was solidified on the potassa, it gradually liquefies, and begins to distil at  $210^{\circ}$ ; boiling directly that temperature is reached. At  $280^{\circ}$  the distillation stops again,

and we have in the receiver a thickish, slightly colored, neutral oil, containing an abundance of solid camphreous matter, which gives it a strong smell like hay. This oxygenated oil is the *valerol*.

Exposure to air thickens and resinifies it, but, contrary to the assertion of Gerhardt, does not develop any acid. It is the same with other oxidising agents, such as bichromate of potassa and binioxide of manganese, the influence of neither producing any reaction on litmus.

Valerol absorbs a good deal of ammoniacal gas without forming a salt, another proof that it does not contain the acid. It continues to boil from  $210^{\circ}$  to  $430^{\circ}$ , showing that it has no fixed boiling point.

The steareoptene of valerian ( $C_{24}H_{20}O_2$ )—the crystalline camphreous matter which we have found in the valerol—condenses in great abundance in the neck of the retort. At the same time a little water is disengaged, most likely from that part of the valerol which is resinified. There remain in the retort a green resin ( $C_2H_{20}O$ ) and some valerianate of potassa, but I have never found this salt in the residue of the rectification of *valerol* over potassa. In the latter case no oxidising agent can produce any other than the elements we have mentioned, viz. the steareoptene of valerian, resin, and water. MM. Gerhardt and Cahours are, therefore, in error when they say that valerol becomes changed into valerianic acid.

The foregoing may be considered as an exact analysis of oil of valerian, 100 parts of which contain:—

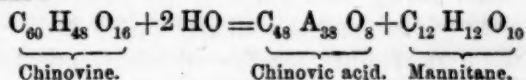
Valerene	.	.	.	.	.	25	
Valerianic-acid	.	.	.	.	.	5	
Valerol	{	Stearoptene of valerian				18	70
		Resin				47	
		Water				5	
						<hr/> 100	

The preceding facts, I believe, prove: 1. That the essential oil *does* pre-exist in the fresh plant; 2. That, fresh or old, it always contains about 5 hundredths of valerianic acid; 3. That rectified over potassa it is perfectly neutral; 4. That it contains two oils: the one a hydrocarbon ( $C_{20}H_{16}$ ) or *valerene*,

which is neutral, and volatilises entirely, leaving no residue; the other oxygenated or *valerol* ( $C_{24}H_{20}O_2$ ), also neutral, becoming resinified in the air and by the action of nitric acid, and decomposing into several bodies; 5. That the valerol is composed of the steareoptene of valerian, resin, and water; 6. That valerol cannot be changed into an acid by any (known) process.—*Annales de Chimie et de Physique, from Chem. News, Dec. 24, 1859.*

## CHINOVINE.

The matter extracted from the cinchona barks, and known variously as chinovic acid, red cinchonic, cinchonic bitter, has been made the subject of a long investigation by H. Hlasiwetz and Dr. von Gilm. They have decided that it is a glucoside having the composition  $C_{60}H_{48}O_{16}$ . In an alcoholic solution, under the influence of chlorine, this breaks up into a sugar which the authors consider identical with the mannitane of Berthelot, and an acid which they call chinovic acid, a change explained thus:—



The acid falls as a crystalline powder. Those crystals are washed with weak alcohol, and then dissolved in strong boiling alcohol, from which they crystallise. The crystals appear to be regular six-sided prisms. They are insoluble in water, only slightly so in ether, but more soluble in boiling alcohol. They dissolve freely in ammonia and the fixed alkalis. All the solutions are bitter. The mineral acids displace the chinovic acid from its combinations, the acid separating as a gelatinous mass.

It is feebly monobasic, and decomposes the alkaline carbonates. The salts of potash and soda are uncrystallisable. Those of baryta, strontia, and lime, prepared by double decomposition, fall as gelatinous precipitates soluble in an excess of water. The chinovate of silver falls as a voluminous precipitate which is very sensible to light. Nitric and sulphuric acids have no action on chinovic acid.—*Chem. Central Blatt, No. 52.—Chem. News, Dec. 17, 1859.*

## PURE BENZOLE FROM COAL-NAPHTHA.

By A. H. CHURCH.

The sulphite of phenyle and ammonium  $C_{12}H_5, NH_4, 2 SO_3$ , usually called sulphobenzolate of ammonium yields a very large proportion of pure benzole when submitted to dry distillation. The hydrocarbon thus procured can hardly be distinguished from the benzole obtained by heating benzoic acid with lime. Its odor is ethereal, almost fragrant; and its boiling-point is constant at  $80^{\circ}.8$ . A chemist well acquainted with the ordinary benzole obtained from coal-naphtha, to whom I showed a specimen of the benzole thus prepared from the sulphobenzolate of ammonium, scarcely recognised it as the same substance, so pleasant was its odor.

To prepare the sulphobenzolate, the purified benzole of commerce is dissolved, with the aid of a gentle heat, in a slight excess of fuming sulphuric acid; if ordinary oil of vitriol be employed, a much larger quantity of the acid is required. The acid liquid, after having been heated in the water-bath for some time, is allowed to cool, and then diluted with water. Commercial carbonate of ammonium, together with some ammonia water, is to be added till the solution is slightly alkaline. The whole is now evaporated to dryness on the water-bath, and the dry mass exhausted with boiling alcohol. The greater part of the sulphate of ammonium remains in the residue. The alcoholic solution of the sulphobenzolate of ammonium is to be transferred to a retort, and submitted to distillation. When all the alcohol has distilled over, the receiver is changed, and the heat raised. The benzole which collects in the receiver is accompanied by small quantities of solid products and by water. From these it may be separated by the addition of a strong potash-solution, and the removal of the supernatant oil by the pipette. The benzole is then rectified off caustic potash. The benzole thus produced is perfectly pure; and although the quantity obtained is not very large yet the result of the process is exceedingly interesting to the chemist, since it removes all doubt concerning the identity of the benzole from coal-naphtha and similar sources with that obtained from benzoic acid.—*Chem. News*, Dec. 31, 1859.

## ANALYSIS OF TOKAY WINE.

By DR. ZIUREK.

The quantitative analysis gave the following results:—

One hundred grammes of a pure sample of this wine contain,

Absolute alcohol,	-	-	-	9.108 grms.
Enanthic ether (imponderable,)				
Grape sugar,	-	-	-	11.031
Enanthin (gum,)	-	-	-	4.137
Fatty matter,	-	-	-	0.007
Albuminous matter,	-	-	-	0.113
Tannin,	-	-	-	0.311
Extractive,	-	-	-	1.378
Acetic acid,	-	-	-	0.032
Tartaric and uvic acids,	-	-	-	0.211
Bitartrate of potassa,	-	-	-	0.238
Tartrate of lime,	-	-	-	0.113
Phosphate of magnesia and lime,	-	-	-	0.265
Sesquioxide of iron,	-	-	-	0.113
Alumina and silica,	-	-	-	traces.
Water,	-	-	-	72.900

99.957

*Archiv. d. Pharm.*, 1859, Novb. 155, 156.

J. M. M.

## ON THE SPECIFIC GRAVITY OF WATER AT DIFFERENT TEMPERATURES.

By W. H. PILE, PHILADELPHIA.

As a small contribution to science, I present to the Association the following tables on the specific gravity of water at different temperatures, collected from various sources, and comprising my own observations on the same subject.

By way of introduction, I may state that it has been a matter of necessity with me to have a table of this kind, in order to graduate my specific gravity bottles at any temperature, without the trouble and uncertainty of reducing the water to 60° F. artificially, which, in very warm weather, would vitiate the results, by the deposit of moisture on the outside of the glass bottle, as



well as from the rise of temperature during the process of weighing.

Having examined and compared together several tables by different authors, I was struck by the discrepancy between them; so much so that I thought it better to construct a table for myself, particularly as my object was merely to ascertain the weight of a 1000-grain bottle, filled with pure water at different temperatures, without taking into consideration the expansion of the glass bottle.

The experiments were made throughout the year, at the varying temperatures of the season, ranging from  $50^{\circ}$  to  $96^{\circ}$ , and comprise a large number of observations. These were finally collected together, averaged and arranged.

In order to compare my experiments with the others, I have corrected the results which I obtained, by allowing for the expansion of the glass bottle.

According to Lavoisier and Laplace, flint glass expands for each degree of Fahrenheit  $\frac{1}{224640}$  of its length. By the necessary calculation it will be found that its cubical dilation will be such that a bottle containing 1000 grains of water at  $60^{\circ}$  F., will contain nearly .013 grains more for each degree above that temperature. Therefore, to obtain the true specific gravity of water from its weight, as observed in the bottle, it is only necessary to subtract .013 grains for each degree above  $60^{\circ}$  F., and to add that quantity for temperatures below  $60^{\circ}$ .

I may also observe that the discrepancies between the tables are much more apparent when water is assumed to weigh 1000 at its greatest density (about  $40^{\circ}$  F.) than when it is reckoned to weigh 1000 at  $60^{\circ}$ , as in the annexed tables; in the former case, the variation commencing  $20^{\circ}$  lower in the scale.

The tables which I have collected, have all been calculated and reduced to the same standard, viz. : water at  $60^{\circ}$  F. = 1000. This has occupied considerable time, from the fact that the original observations are reckoned from different points, and with different thermometric scales.

Thus in Kopp's table of the expansibility of water, the specific gravity of the water was first calculated from its observed expansion; next, the results were reduced from Centigrade to Fahrenheit's scale; and lastly, as Kopp assumes water at  $32^{\circ}$

F. to equal 1000, the results were again reduced, so that water at 60° should equal 1000.

TABLE No. 1.—Reduced from Kopp's table as above stated. (Vol i. of the Cavendish Society's Works.)

TABLE No. 2.—Tralles' table for every 5°, the intervening degrees being interpolated: Water at 40° = 1000. (Ure's Dictionary, Art. Alcohol.)

TABLE No. 3.—Hallstrom's table for every 9°: Water at 39.38 = 1000. (Booth's Cyc. of Chem.)

TABLE No. 4.—Despretz's table of the expansibility of water: Water at 4° C. (39.2° F.) = 1000. (Journal de Chim. et de Phys., vol. lxx., 1837.) Contained in a very able and lengthy paper, giving all the details of the numerous experiments on the subject.

TABLE No. 5.—Hassler's observations, collated and reduced by J. H. Alexander: Water at 40° = 1000. (Silliman's Journal, vol. xvi., 1853.) These experiments were originally published in a congressional document (1832) in a report on the comparison of weights and measures, and are stated to have been made on a very large scale.

TABLE No. 6.—My own observations, corrected for the expansion of the glass bottle, as previously remarked.

Temp. Fahr.	1 Kopp.	2 Tralles.	3 Hallstrom.	4 Despretz.	5 Hassler.	6 W. H. Pile.
32°	1000.78	1000.80	1000.69			
33°	1000.80	1000.83	1000.71			
34°	1000.83	1000.85	1000.73			
35°	1000.85	1000.87	1000.75			
36°	1000.87	1000.88	1000.77			
37°	1000.88	1000.88	1000.78			
38°	1000.89	1000.89	1000.79			
39°	1000.89	1000.89	1000.80	1000.95		
40°	1000.90	1000.90	1000.80	1000.95	1000.63	
41°	1000.89	1000.89	1000.80	1000.94	1000.63	
42°	1000.88	1000.89	1000.79	1000.94	1000.63	
43°	1000.87	1000.88	1000.78	1000.93	1000.63	
44°	1000.85	1000.88	1000.77	1000.91	1000.62	
45°	1000.83	1000.87	1000.75	1000.88	1000.61	
46°	1000.80	1000.85	1000.73	1000.85	1000.59	
47°	1000.77	1000.83	1000.70	1000.82	1000.57	
48°	1000.73	1000.80	1000.66	1000.78	1000.55	
49°	1000.69	1000.76	1000.62	1000.74	1000.52	
50°	1000.65	1000.70	1000.58	1000.69	1000.49	1000.67

## 148 GRAVITY OF WATER AT DIFFERENT TEMPERATURES.

Temp. Fahr.	1 Kopp.	2 Traill.	3 Hallstrom.	4 Despretz.	5 Hassler.	6 W. H. Pile.
51°	1000.60	1000.65	1000.54	1000.64	1000.46	1000.62
52°	1000.55	1000.59	1000.49	1000.59	1000.42	1000.56
53°	1000.50	1000.53	1000.44	1000.53	1000.38	1000.50
54°	1000.44	1000.46	1000.39	1000.46	1000.34	1000.44
55°	1000.37	1000.39	1000.33	1000.39	1000.29	1000.37
56°	1000.31	1000.32	1000.27	1000.32	1000.24	1000.30
57°	1000.24	1000.25	1000.21	1000.25	1000.18	1000.23
58°	1000.16	1000.17	1000.14	1000.17	1000.13	1000.16
59°	1000.08	1000.09	1000.07	1000.09	1000.06	1000.08
60°	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
61°	999.91	999.91	999.93	999.91	999.93	999.91
62°	999.82	999.82	999.85	999.81	999.86	999.82
63°	999.73	999.72	999.76	999.71	999.78	999.72
64°	999.63	999.62	999.67	999.60	999.70	999.62
65°	999.53	999.51	999.57	999.49	999.63	999.53
66°	999.43	999.40	999.47	999.38	999.53	999.43
67°	999.32	999.29	999.36	999.27	999.44	999.33
68°	999.21	999.17	999.25	999.17	999.35	999.23
69°	999.10	999.05	999.14	999.06	999.26	999.12
70°	998.98	998.93	998.93	998.95	999.16	999.01
71°	998.86	998.81	998.91	998.84	999.05	998.90
72°	998.73	998.69	998.79	998.72	998.95	998.78
73°	998.60	998.56	998.67	998.60	998.84	998.66
74°	998.48	998.43	998.55	998.47	998.72	998.53
75°	998.34	998.30	998.42	998.34	998.60	998.40
76°	998.21	998.17	998.29	998.20	998.48	998.27
77°	998.07	998.04	998.16	998.06	998.36	998.13
78°	997.93	997.90	998.02	997.91	998.23	997.99
79°	997.79	997.76	997.88	997.76	998.10	997.83
80°	997.65	997.61	997.74	997.61	997.96	997.69
81°	997.50	997.46	997.59	997.45	997.82	997.52
82°	997.35	997.31	997.44	997.29	997.68	997.35
83°	997.20	997.16	997.28	997.13	997.54	997.18
84°	997.05	997.01	997.16	996.97	997.39	997.01
85°	996.89	996.85	996.96	996.81	997.23	996.83
86°	996.73	996.69	996.79	996.65		996.64
87°	996.57	996.53		996.48		996.46
88°	996.40	996.36		996.31		
89°	996.23	996.19		996.14		
90°	996.05	996.01		995.97		

NOTE BY THE EDITOR:—In the Proceedings of the American Pharmaceutical Association, for 1859, in which the above tables originally appeared; by an unfortunate transposition of the types, the specific gravity of water in all the columns for 60° was placed at the top of the page opposite 51°. Consequently all the other lines of figures, from the 51° to the 59° inclusive, were misplaced one line too low down. We have corrected these errors in our reprint, also filled up the blanks, previous to the periods, left vacant in the original.

## REMARKS ON POLYGALIC ACID.

BY WILLIAM PROCTER, JR.

Among the questions proposed last year for investigation, the following was accepted by me:—

“What is the most eligible process for obtaining Polygalic acid from Senega? In what proportion does it exist in that root? And what are the forms for prescribing it as substitutes for the preparations of seneka?”

Seneka snake root, as one of the most efficient American contributions to the *Materia Medica*, early attracted the attention of European pharmacutists and chemists, and at least half a dozen analyses of it had been published more than twenty years ago, when it was very fully investigated by Quevenne, (*Jour. de Pharm.*, 1836, 449) in his inaugural essay sustained at the School of Pharmacy, at Paris.

According to this analysis the constituents of seneka are as follows, viz.:—

ORGANIC.	INORGANIC.
Polygalic acid, Virgineic acid, Pectic acid, Tannic acid, Bitter yellow coloring matter, Gum, Albumen, &c., Cerin, and fixed oil.	Carbonate, Phosphate and Sulphate of Potassa, Chloride of Potassium, Carbonate, Sulphate, and Phosphate of Lime, Alumina, Magnesia, Silica, and Iron.

Polygalic acid, so called by Quevenne, was previously made known in a less pure state, as *senegin*, by Gehlin. It is the active constituent of the root, although some influence may be due to the virgineic acid and coloring principle. It may also be noticed that both Dulong and Foenuille found malic acid in this root, united with lime and potassa.

It may not be out of place to state the characteristics of this substance, as it is certainly deserving of a better destiny than has thus far been accorded to it. Polygalic acid is a white amorphous powder, without any tendency to crystallize, and is unalterable in the air. It is inodorous when pure, but is apt to retain traces of virgineic acid. Its taste, at first but slight, soon becomes pungent and acrid, and produces a painful con-

striction of the throat. When its dust is inhaled through the nostrils, irritation and violent sneezing occur. It is not volatile; when burnt in a tube it affords no nitrogen, and is wholly combustible. Polygalic dissolves slowly in cold water, but readily in hot water, forming a solution which reddens litmus paper, and froths strongly by agitation. It is soluble in boiling alcohol, but the larger part separates on cooling. It is soluble in diluted alcohol, but the solution has a tendency to deposit it on standing. It is absolutely insoluble in ether, and in acetic ether, the fixed and volatile oils. It is soluble in alkaline solutions, with the production of a greenish yellow coloration. It is precipitated in its free state by subacetate of lead, and proto nitrate of mercury, but by no other salts; various salts throw it down from solution when it is combined with an excess of potassa or soda. When heated with nitric acid it affords oxalic and picric acids, and sulphuric acid decomposes it with a rose and violet color. The acid character of this substance is so slight that it will not decompose the carbonates, yet it forms amorphous salts with alkaline and metallic bases. Quevenne suspected a close relationship between polygalic acid and saponin. More recently (Ann. der Chemie, and Amer. Jour. Pharm. vol. xxvii., 43) M. Bolley has resumed the inquiry, and believes that both saponin and polygalic acid are glucosides, like salicin, resolved by hydrochloric acid, into sugar and a derivative body *sapogenin*, and that their formula is the same.

*Preparation of Polygalic Acid.* The particular object of this paper is the preparation and administration of this substance. The original process of Quevenne required precipitation by acetate of lead, and the action of sulphuretted hydrogen; but he afterwards greatly simplified the process, but retained some complications not necessary to obtain the acid sufficiently pure for medicinal use. The following process I have tried several times, and it has the merit of great simplicity.

Take of Senega, in powder, (50 meshes to the inch) 10000 grs.  
Alcohol,

Ether, and water, each, a sufficient quantity.

Moisten the senega with half a pint of a mixture of two parts of alcohol and one part of water, pack it in a large glass funnel; cover the surface with a piece of muslin, or paper, and pour on



the same liquid until three pints have slowly passed by drops, or until the root is nearly exhausted. Evaporate this tincture to twelve fluid ounces, which removes nearly the whole of the alcohol, and then agitate it with repeated portions of ether, until the latter ceases to acquire color, decanting each portion before adding the next, which requires about a pint and a half. The syrupy liquid is now mixed with a pint and a half of strong alcohol, and a half a pint of ether, well agitated several times and set aside to repose. The polygalic acid being nearly insoluble in this menstruum, precipitates as a bulky light fawn-colored precipitate. If on adding a small portion of the clear liquid to a similar mixture of ether and alcohol, no precipitate occurs, the whole of the polygalic acid capable of being thus thrown down has been separated. The supernatant liquid is now carefully decanted from the precipitate, which is thrown on to a filter and carefully washed with a mixture of two parts of alcohol and one of ether, till the adhering colored liquid has all been displaced. The filter is then spread on an absorbent surface of paper, pressed strongly, the mass broken into small fragments, dried, and powdered. The resulting powder weighs 550 grains,  $5\frac{1}{2}$  per cent. of the weight of the senega; making allowance for wastage, senega may be said to contain one-sixteenth of its weight of this substance, and consequently thirty grains will equal an ounce of the root.

In this state polygalic acid is not pure, but is sufficiently so for all medical purposes. It retains traces of coloring matter, and of some substances which are separated by the ether, but in very small amount. By re-dissolving it in hot water, and precipitating with the mixture of ether and alcohol, and afterwards dissolving it in hot alcohol, with animal charcoal, and filtering hot, it is obtained quite white.

The ethereal washing liquids first obtained were evaporated till no ether remained. The residue consisted of a dark amber-colored fixed oil, admixed with crystals of virgineic acid, which formed a crust on its surface, and a dense aqueous solution of the same acid, which strongly affected litmus paper.

The liquid from which the polygalic acid precipitated was allowed to stand a month, when the sides and bottom of the vessel were spangled with a crystalline matter, in small quantity.

This substance is soluble in water, when heated; less soluble in alcohol; gritty between the teeth; has no taste of senega; fuses by heat, blackens, and is almost entirely consumed. Concentrated  $\text{SO}^3$  dissolves it with heat without the evolution of either ammonia or  $\text{HCl}$ . Its aqueous solution is not precipitated by either chloride of barium or nitrate of silver. A crystal placed on moistened litmus paper produced a reddish spot. It is possible that this substance is an acid salt of malic or some analogous acid. The small quantity of ash it leaves is alkaline. The investigation was not pushed further.

The liquid, from which the crystals deposited, by evaporation yielded an extract tasting strongly of senega.

As regards the pharmaceutical applications of polygalic acid, several experiments were made:—

1. Five grains of the acid in a fluid ounce of water, kept in a vial for two months, acquired a foetid odor, whilst a portion of matter precipitated, yet the taste of the solution was strongly that of senega.

2. Five grains of the acid were dissolved in an ounce of cold water, with five grains of bi-carbonate of potassa, and kept the same length of time. This solution also spoiled, but retained its senega taste.

The best form of prescribing polygalic acid, in liquid form, is with syrup of gum arabic, to blunt its acrimony. It is necessary to dissolve it in a little hot water, and add it warm to the syrup of gum, and mix them. It may also be added to syrup of ipecacuanha to increase its expectorant power. But the form best adapted to administer this principle is in pills and powders. In doses of one or two grains (which represent 15 to 30 grains of senega) the full effect of a table spoonful and a fluid ounce of decoction of senega is obtained. Where a more gentle effect is desired, the dose must of course be greatly reduced, to  $\frac{1}{4}$  or  $\frac{1}{2}$  of a grain, and can be associated with ipecac, tartar emetic, and other medicine with which senega is given. When the form of powders is adopted, a mixture of powdered gum and sugar should always be added to blunt the acrimony of the polygalic acid. Sugar of milk triturated with the acid, in the proportion of 1 grain to 9 grains, is an eligible form for use.

In cough mixtures, when not contra-indicated or incompati-

ble, the addition of an equal weight of bi-carbonate of potassa facilitates its solution. It is not advisable to keep a permanent liquid preparation of polygalic acid, leaving that form for the officinal syrup, but it undoubtedly offers an admirable means of using senega in the forms above indicated, when the physician can regulate the dose and associate it with other remedies in the nicest manner.—*Proc. Am. Pharm. Association*, 1859.

#### ON THE DETECTION OF PHOSPHORUS.

By DR. FRED. HOFFMAN.

The author has instituted a series of more than one hundred and fifty experiments with Mitscherlich's method for detecting phosphorus. He has mixed the phosphoric mass of matches in different preparations, with food cooked in various ways, with beverages commonly used, and with medicines in a liquid, soft and plastic state, and kept the mixtures for a variable length of time. The presence of phosphorus, it will be remembered, is established by the phosphorescence imparted to the aqueous vapors on distilling the liquid or liquified mixture, and the distillation of the phosphorus is increased by the addition of sulphuric acid, chloride of sodium, sugar, &c., whereby the boiling point is made to approach that of phosphorus.

In the place of Mitscherlich's apparatus, the author has constructed a more simple one, which is easily prepared and readily taken apart. It consists of an ordinary flask, connected with a receiving bottle by means of a glass tube, which passes about eighteen inches through a glass cylinder, filled with cold water. A long, straight tube conducts the gaseous products from the bottle. The lamp and flask are surrounded with dark paper, and about three-fourths of the glass cylinder. The operation is best performed in a dark room.

The phosphorescence of the liquid increases in intensity with the consistence of the liquid and the quantity of the phosphorus. The gas bubbles are luminous, rise in the mixture, and apparently burn upon its surface with a bright flame. With the temperature the light is increased; a photosphere fills the flask, rises in the tube, and moves up and down within the cooled part.

Sometimes only a column or a luminous ring appears stationary at the point where the vapors are cooled, and a luminous fog or sparks gradually sink into the receiver, or a sudden, frequently-repeated lightening is observed. If the heat is raised too high, or the cooling is insufficient, the luminescence passes through the long gas-tube, at the mouth of which the gases take fire, if the volatile oils from cruciferæ (mustard, &c.) have been present.

Coffee, mustard, smoked meat, highly-seasoned food and beverages, and medicines containing odorous gum-resins, volatile oils, musk, castor, camphor, chlorine, &c., have the property of covering the odor of a small portion of phosphorus; minute quantities, which yet produce the symptoms of gastro-enteritis, may not be recognized by the odor in the contents of the stomach. The reaction is not prevented, except by the presence of much alcohol, volatile oils and mustard. If the quantity of phosphorus be not too insignificant, the phosphorescence is observed, either momentary or constant, at the beginning of the distillation, and after the alcohol has passed over.

The reaction is not interfered with by the presence of ipecac., tartar emetic, magnesia, hydrated oxide of iron, musk, castor, opium, albumen, neutral acid, or basic salts and double salts, volatile organic acids, chlorides, iodides and sulphides, and by free acids; but iodine, chloride and bichloride of mercury in considerable proportion, and metallic sulphides in the presence of free sulphuric acid, and particularly oleum cinæ, (artemisizæ,) interfere with or prevent the reaction.

Numerous experiments, by distilling the brain of various animals, blood, albumen, casein, fibrin, legumin and other protein compounds with diluted sulphuric acid, yielded not the least photospheric reaction.—*Archiv. d. Pharm.*, 1859, Oct., 22-26.

J. M. M.

---

#### ON CYCLAMIN AND THE TUBER OF CYCLAMEN EUROPÆUM, L.

Dr. T. W. C. Martius has published in Buchner's N. Repert. viii. 388-395, an account of his experience in preparing cyclamin. The author recommends the following method:—Six

pounds of the dried tubers, collected in the fall, are reduced to a coarse powder, mixed with two pounds of animal charcoal, digested for twenty-four hours in a still with six gallons of alcohol of at least .825 spec. grav., then boiled, the distilled alcohol being returned into the still, and expressed while yet warm; the residue is treated in the same manner with  $4\frac{1}{2}$  galls. alcohol, and the mixed tinctures, after having been filtered, are distilled until one-fourth is left behind, which residue is set aside for six or eight weeks. The precipitate is then washed upon a filter with alcohol until it passes colorless. The filtrate and the washings are mixed and evaporated to three or four quarts. In a few weeks more cyclamin will have separated; after washing it is added to the portion first obtained. The whole is then mixed with 6 oz. animal charcoal, and treated with 4 pints of boiling alcohol. On standing over night, the filtrate deposits most of the cyclamin; the liquid portion is distilled or evaporated to 6 or 8 oz., and will separate some more cyclamin after several days.

Cyclamin is a white granular powder, uncrystallizable, soluble in alcohol and water. The aqueous solution is fluorescent, and coagulates on boiling, but the coagulum redissolves in the liquid: insoluble in ether, chloroform, glycerin and caustic alkalies. The solutions are neutral to test paper. They are precipitated white by nitrate of silver, acetate and subacetate of lead, and bluish white by sulphate of copper. When boiled with diluted acids, it yields glucose in solution and a white granular precipitate, *cyclamiretin*, insoluble in water and ether, but soluble in alcohol.

According to Dr. Klinger's analysis, cyclamin is composed of  $C_{40}H_{24}O_{20}$ ; cyclamiretin =  $C_{28}H_{16}O_{12}$ .

In the "Zeitsch. der Aerzte zu Wien," Prof. Dr. G. Schroff has published the results of his experiments with cyclamin and the root of *Cyclamen Europæum*. The following is selected from an abstract of that paper in *Buchner's N. Rep.* viii. 452-459.

Cyclamin is amorphous, white, of a disagreeable acrid taste, persistent in the throat. Its aqueous solution foams like soap water. It coagulates between 60 and 75° C. (140 and 167° F.)



From their experiments De Luca and Bernard came to the conclusion that cyclamin had properties similar to curara. Pelikan thinks it an acrid poison. The following are the most important of Prof. Schroff's results:—

Cyclamin is a poison; it is the most powerful, but not the only active, constituent of the root. The well-dried root may be preserved for several years without losing its efficacy. It is without any influence on the skin. It produces burning, nausea and vomiting, but no inflammation of the mucous membranes of the mouth and stomach. Introduced into the respiratory organs it absorbs hæmatin from the blood, and produces intense inflammations; also hyperinosis. It causes intense inflammations in the rectum, the peritoneum, and when introduced below the skin. It exerts only a passing influence on the cerebro-spinal system, when introduced directly into the circulation. Its action is directed towards the salivary glands. After being absorbed it probably alters the composition of the blood; it is uncertain yet in what state and by which organs it is excreted. In its properties it is similar and stronger than smilacin, senegin and saponin; gastritis excepted, it also resembles emetia, colocynthin, elaterin and colchicia, but is weaker. It differs essentially from the narcotic and acrid-narcotic poisons.

The juice of the root of *Cyclamen Europæum* has only the properties of cyclamin. The quality of the action of the fresh root is the same as of the dried tuber, but in quantity it is less, being one-third of the latter. The alcoholic extract has the same qualitative properties, but is double the strength of the dried root. The aqueous extract is almost inert; a boiling temperature injures the activity. Besides the symptoms produced by cyclamin, the root and alcoholic extract cause gastritis.

*Cyclamen* is a fish-poison; its juice, coming into contact with their respiratory organs, forces the fishes to seek the surface of the water, and ultimately kills them.

J. M. M.

ON THE SEAT OF THE VESICATING PRINCIPLE, OF *LYTTA VITTATA*.

By JOSEPH LEIDY, M. D.

Prof. of Anat. in the University of Penn'a.

It often occurred to me that the vesicating principle of the blistering fly, *Cantharis*, *Lytta*, etc., was the product of some special organ in the insect, and was not diffused through the body of the animal. In polyps, bees, wasps, mosquitos, etc., we find the irritating agencies or poisons produced by particular cells and glands, not to mention the poisons and odorous principles found in special organs of higher animals. A few days since, observing numerous individuals of *Lytta vittata* feeding on *Amaranthus albus*, I collected a number, and at a leisure moment experimented with the different parts of the animal to ascertain if the vesicating principle was confined to some special part of the insect. I did not then recollect of having read of others who had performed similar experiments with the same object, but on examination, find in Pereira, under the head of *Cantharis vesicatoria*, the following remarks:

"The active and odorous' principles of cantharides reside principally in the sexual organs of the animals. Both Farines and Zier tell us that the soft contain more active matter than the hard parts. It appears, also that the posterior is much more acrid than the anterior portion of the body; and Zier says the ovaries are particularly rich in this active matter."

Though I have long been familiar with the researches of Audouin on the anatomy of the Spanish fly, I remembered that he had made no mention of the source of irritating power in the insect. The anatomy of *Lytta vittata* is so nearly like that of the *Cantharis vesicatoria* as described by Audouin, that I shall say nothing about it except in the way of reference. Without examining the work of Farines and Zier, I will detail the results of my experiments on the *Lytta vittata*, and leave it to others to compare them with the experiments of the former authors.

The *Lytta vittata* appears not to possess the peculiar mice-like odorous principle of the *Cantharis vesicatoria*, at least I have not observed it in living or fresh dead specimens, nor in specimens dried and long preserved.

When the *Lytta* is caught, it exudes a clear yellow liquid,

usually in one or two drops, from a corresponding number of the knees, though smaller drops are not unfrequently seen to appear at other joints of the legs. This liquid appears to be the blood of the animal, for it is in all its physicomicroscopical characters like this fluid obtained from any part of the body. If an elytrum is cut across, one or two drops of the same liquid exudes from vessels of the cut margin. The liquid forms a fibrinous coagulum, and contains colorless corpuscles, like the blood of insects ordinarily. The exudation occurring on the capture of the *Lytta*, I suspect to be the result of voluntary rupture of the parts, which is not extraordinary when we take into consideration the ease with which insects will sacrifice a leg. Be it as it may, the yellow liquid from any part of the body vesicates. Portions voluntarily exuded on the capture of the insect, others from the cut borders of the elytra, from cut extremities of the legs, and from the head, imbibed by separate portions of bibulous paper produced upon the inner side of my forearm a corresponding number of blisters. As the nettle among plants, and the larva of the egger moth have stinging hair, I was led to try those of the *Lytta*. A quantity scraped from the elytra and other parts were mixed with cerate and applied to my forearm. They proved to be inert.

Half a dozen elytra cut into fragments and mingled with cerate produced a blister. This was the result of the contained yellow liquid or blood, for a nearly entire elytrum vesicated only at the point of contact of the cut border.

The intestinal canal with its leafy contents produced no effect. The muscles of the thorax, and the rete adiposa, or fatty matter common in insects, separately applied to the forearm, produced no effect. The testicle and epididymis of the male likewise were inert; as were also two long tortuous accessory glands of the generative apparatus in the same sex. Two other accessory glands of the generative apparatus in the male, equally long and tortuous with those just indicated, are distended with an opaque white granular matter. This matter, mingled with cerate, was found to be highly vesicant. Viewed with the microscope it seems to be a consistent fat-like substance; appearing as spherules of various sizes with dark outlines, fainter concentric lines, and others radiating. The spherules recalled to

mind the appearance of the crystalline lens with its concentric layers and radiating fibres.

The ovary vesicated. The result also was obtained from the isolated eggs, crushed and mingled with cerate. A large pyriform sac attached to the generative apparatus of the female, contains a yellow sebaceous-like matter, together with a mass of hard opaque white substance. The former material appears to consist of spermatic matter, epithelial cells, and an albuminous substance; and it is inert as a vesicant. The mass of hard white substance is composed of the same fat-like spherules above described as existing in accessory glands of the male generative apparatus. I have occasionally observed it to be absent, and suspect that together with the other contents of the pyriform sac it is derived from the male. Mingled with cerate, I found it also to be a vesicant. My friend, Dr. Darrach, also applied portions of the two different substances, from the pyriform sac of the female generative apparatus, to his forearm. The fatty-like spherules alone vesicated.

Thus, as a result of the experiments above briefly detailed, the vesicating principle of *Lytta vittata* appears to belong to the blood, the peculiar fatty substance of certain accessory glands of the generative apparatus, and to the eggs.—*Am. Journ. Med. Sci.* Jan. 1860.

---

#### ON SANTONATE OF PROTOXIDE OF MERCURY, AN EXCELLENT VERMIFUGE.

The solutions of equal parts of protonitrate of mercury and santonate of soda, in distilled water, are mixed; after 24 hours, the precipitate is separated by a filter, well washed with distilled water, dried at a moderate heat, and preserved in bottles excluded from the light.

The protosantonate of mercury is a whitish powder, somewhat crystalline under a magnifier, inodorous, and of a slight metallic taste, which is afterwards bitterish and very persistent. It is insoluble in water and alcohol, unaltered at 212°, charred at a high temperature and decomposed into mercury and red oxide of mercury; lime water decomposes it into soluble santonate of lime and black oxide of mercury.

A solution of sulphide of potassium decomposes it at  $212^{\circ}$ , forming black sulphide of mercury and soluble santionate of potassa. A warm solution of iodide of potassium yields with it greenish iodide of mercury and santionate of potassa.

Exposed with alcohol to the temperature of boiling water, a turbidity is produced on the addition of water, but no precipitate. Thereby the salt is distinguished from santonin, which under the same circumstances is precipitated. When treated with diluted nitric acid, protonitrate of mercury is dissolved and pure santonin left behind.

Other acids show the same behaviour as nitric acid, and alkalies decompose it like limewater. (From the Italian, by Dr. John Müller of Berlin.—*Arch. d. Pharm. Nov. 1859*, 147-149.)

*Note.*—The dose of this preparation is not mentioned, and no quantitative analysis appears to have been made. J. M. M.

#### ON THE SOLUBILITY OF ALKALOIDS, ETC., IN CHLOROFORM.

By A. SCHLIMPERT.

But very little is known of the solubility of alkaloids in chloroform, which behaviour may frequently be employed, for instance in detecting impurities in the more soluble alkaloids, for separating quinia and santonin from their preparations, &c. It likewise appears not impossible that chloroform may be employed, with advantage for the preparation of some alkaloids like atropia, and some others of the more soluble ones.

The alkaloids were first examined for their purity, shaken and digested with chloroform for three hours, at a temperature of  $64^{\circ}$  F. The solution was filtered at the same temperature, weighed, evaporated, and the residue weighed.

100 parts of chloroform dissolve of

Morphia,	1.66 parts.	Atropia,	33.0 parts.
Acetate of morphia,	1.66 "	Strychnia,	14.1 "
Quinia,	15.— "	Nitrate of strychnia,	6.6 "
Sulphate of quinia,	0.0 "	Caffeina,	11.— "
Muriate of quinia,	11.1 "	Digitalin,	1.25 "
Cinchonia,	2.50 "	Brucia,	14.— "
Sulphate of cinchonia,	3.— "	Aconitia,	22.— "
Chinoidin,	25.3 "	Pure santonin,	23.— "
Veratria,	11.6 "	Santonin,	33.3 "



The last santonin had been colored yellow by sun light; the solution was likewise of a yellow color, but lightened gradually, and was at last colorless. If the chloroform is now evaporated at a very moderate heat, the santonin crystallizes in colorless tablets; if the heat was too high, the solution assumes again a yellowish color, and the santonin is separated with the same color.

Sulphate of quinia being insoluble in chloroform, any sulphate of cinchonia with which it may be coexamined, may be separated by that liquid.—*Archiv d. Pharm.* 1859, Nov. 151, 152.

J. M. M.

#### MALAMBO BARK.

The origin of this aromatic bark, which has been a disputed question ever since its introduction to Europe by Bonpland in the year 1814, has at length been satisfactorily determined by Mr. H. Karsten, of Berlin. A residence of twelve years in the northern countries of South America has enabled Mr. Karsten to make many interesting and important observations on the vegetation of that botanically rich region, the result of which observations he is now communicating to the scientific world in a magnificently illustrated work, under the title of *Floræ Columbiae Terrarumque adjacentium Specimina selecta*. From this work, in which the Malambo tree is beautifully figured, we extract the following description and remarks:—

CROTON MALAMBO Krst. *Euphorbiaceæ* R. Br.

*Character differentialis.*

Arbor foliis ovalibus, crenato-serratis, glabris basi bict in crenaturis uni-glandulosia.

*Character naturalis.*

Arbor duodecim vel quindecim-pedalis in littoribus australibus maris caribæi habitans, trunco recto quadripedali, cortice suberoso flavescenti odore camphoreo-aromatico prædito, tecto; cacumine ramoso ellipsoideo; foliis alternis, glabris hircino-odoris glandulis oleiferis, pellucido-punctatis, bistipulatis,—stipulis minutis linearibus, acutissimis, caducis,—longe petiolatis, petiolis 1—2½ pollicaribus, lamina ovali basi rotundatæ excisa, subtus utrinque glandulam minutam, patelliformem gerentibus, margine crenato, in crenaturis glandulam illis similem fovente, 4—5 pollices longa 2—2½ pollices lata.—Inflorescentia terminalis racemosa, monoica. Flores bractea minuta, caduca sustentati, feminei inferiores 3—8, longe pedunculati, majores. Calyx campanulatus, quinquepartitus persistens, lobis lanceo-

lato-triangularibus, margine pilosiusculis, æstivatione valvatis. Discus glandulosus hypogynus quinquedentatus; dentes (petala rudimentaria) filiformes, longitudine calycis urceoli, apice pilosi, subpenicillati, cum lobis calycinis alternantes. Ovarium pilis stellatis caducis hirtum, triloculare, loculis uniovulatis; styli tres basi pilorum fasciculo penicillato tecti, bifidi, stigmatosi. Flores masculini superiores plures, breviter pedicellati. Calyx quinquefidus extus pilis stellatis hirtus, lobis triangularibus, æstivatione valvatis. Petala quinque, lobis calycinis alterna, lanceolata, longitudine calycis, hyalina, intus pilosa et margine fimbriata, evanescentia, æstivatione imbricata. Stamina 18—20 disco piloso, decem cronato inserta; filamenta libera, subulata, glabra, per æstivationem erecta; antheræ ovales birimosæ basi affixæ. Pollen globosum granulosum. Ovarii rudimentum nullum. Fructus sub-globosus 3"—4" in diametro, stylorum residuis coronatus, lævis, glaber, capsularis, tricoccus, coccis monospermis; seminibus haud maturis testa flavescens. Floret Majo.

The preceding species is distinguished from every other of the genus *Croton* (as we find from Baillon's recent labors on this family) by the 10-sided glandular ring of the male flower and the position of the stamens in the bud, which while in this state are not incurved, as is usual in the genus, but stand perfectly erect. To found a generic division, however, upon these characters appears unnecessary. To the sub-genus *Eucroton* (Baillon, *Etude générale des Euphorbiacées*, 1858) *C. Malambo* is in close proximity. From the very few species with glabrous leaves with which *C. Malambo* may be compared, the latter is distinguished by its oval leaves from *C. castaneifolium* L. (*Sp. Pl.*, ed. 1), which has lanceolate leaves; and from *C. ovalifolium* Wild. and *C. microphyllum* Lom. by its branches being glabrous and not hairy.

*Croton Malambo* grows in the neighborhood of the Caribbean Sea on the north coast of Venezuela and New Granada, in the former of which countries it is known by the names of *Torco* or *Palo Mathias*, and in the latter by that of *Malambo*. In New Granada, especially, it is of very frequent occurrence in the country lying between Rio Hacha and Carthagena, where sometimes in the low forests of the coast it prevails to a vast extent. Its stem, which grows to a height of four feet, is covered with a yellowish-white, rough, externally somewhat corky bark, which possesses a very aromatic odor resembling that of *Calamus aromaticus*. The leaves have, when bruised, a peculiar hircine odor, which is not very agreeable. The bark is a remedy of con-

siderable reputation throughout all Columbia ; its aqueous infusion is used inwardly in diarrhoea and as a vermifuge, while the alcoholic tincture is employed externally in rheumatism. Its application for these purposes is extolled by both the medical profession and the public. It is said also to have proved useful in the treatment of cholera.

[In the United States, it is said to be largely used for the adulteration of ground spices. D. H.]—*London Pharm. Jour.* Dec. 1859.

---

CULTURE AND PRODUCTION OF ELATERIUM AT HITCHIN,  
ENGLAND.

Till within the last few years the cultivation of the wild or squirting cucumber (*Ecbalium officinarum* Rich., *Momordica elaterium* Linn.) was almost entirely confined to Mitcham, in Surrey, and Ampthill, in Bedfordshire. Its cultivation is, we believe, given up at the latter place, at least for commercial purposes ; for, upon making inquiries there, we can obtain no information respecting it. At Hitchin, however, it is now cultivated to some extent by Mr. Ransom, Pharmaceutical Chemist, of that town. We may conclude, therefore, that Mitcham and Hitchin are at the present time the only districts in which it is grown for commercial purposes. Its cultivation at the former place has already been described in this Journal (vol. x., p. 168) ; we propose now to allude to it at the latter.

At Hitchin, the plants are either raised from seeds or by division of the roots. When raised from seeds, these are sown in the spring, usually about the end of March or early in April ; the seedlings are then allowed to remain in the ground where they have sprung up, the soil having been previously highly manured with stable manure. A large number of plants are always self-sown. (The practice thus adopted at Hitchin is, in some respects, different from that carried out at Mitcham, for here it is customary to sow the ground about March, and to plant out the seedlings about June.—*Pharm. Journ.*, vol. x., p. 168.) When the plants are raised by dividing the roots, this operation is performed in the spring, the plants employed for the purpose having remained in the ground during the preceding

winter, at which season they are protected from the frost by being covered with manure and mould. As it is found that the slightest frost destroys the plants, it is necessary to be very careful in thus protecting them from its influence. The plants thus raised by dividing the roots are afterwards planted out in ground highly manured, as is the plan of raising from seed. From the above facts it is clear, that the squirting cucumber, although an annual under natural conditions, yet, by being protected during the winter, its existence may be prolonged beyond a year—indeed, we have seen plants which we have been informed were more than three years old. Hence, an annual plant thus becomes a perennial. Mr. Arthur, of Mitcham, has also observed “that if the roots be covered up during the winter, the plants survive through several seasons; and he has now some which have lived three or four years.” The fruits which are borne by plants more than two years of age, are, however, much smaller, and their yield of elaterium less than those of younger plants; hence it is not customary to grow plants for commercial purposes beyond the second year of their existence.

The plants grow most luxuriantly in a damp, loamy soil; but it is found that a too great development is unfavorable to the production of the fruit, which is the only serviceable part of the plant, because in all cases where the nutritive organs of a plant become highly developed, but little fruit is produced. Hence a moderately dry, loamy soil, which has been highly manured, is that best adapted for the growth of the squirting cucumber. We are informed that a hot, moderately rainy season is that in which the plants thrive best, and yield most elaterium.

The plants flower freely in July and August, and towards the end of the latter month, and the first two or three weeks in September, the fruits are gathered for the preparation of elaterium. It is necessary to gather the cucumbers as nearly ripe as possible, for otherwise they will yield but a very trifling amount of the best elaterium; but, in consequence of their being thus collected in a comparatively ripe condition, the produce of many is lost, from the peculiar and well-known tendency of the fruit to discharge its contents when but slightly touched as it approaches ripeness. The common name of squirting cucumber, as applied to this plant, is thus derived. This loss of the juice in the fields during the process of gathering the cucumbers much increases

the cost of obtaining and preparing elaterium. It is customary to employ boys to gather the cucumbers, and they are obliged to be very careful in handling the plants for the purpose of doing so, as otherwise the fruit frequently discharges its contents, and if this should reach the eye or other sensitive parts, serious consequences might ensue from the irritation thus occasioned. To show the injurious effects that sometimes result from carelessness in handling the fruits, it may be stated that, about two years since, some of the boys employed in gathering them began to play, and whilst doing so one of them squirted the juice into another's eye, and the inflammation excited thereby was so great, that the sight was for some time almost lost, in fact, it was more than a twelvemonth before it was entirely restored.

All the cucumbers produced at Hitchin are employed there for the preparation of elaterium. The process adopted (at least so far as can be ascertained by us, for there are certain peculiarities connected with the mode of collecting and manipulating the elaterium which are kept secret) is as follows:—As the cucumbers are brought in from the field, they are at once washed to free them from adhering dirt and other foreign matters. This process of washing is, we are informed, always resorted to, but it becomes more necessary when the fruits are very dirty. Each cucumber is then cut lengthwise, so as to divide it into halves. This operation is usually performed by boys, and as the fruit is thus cut, the halves are received into glazed earthenware pans. The divided cucumbers are then placed as soon as possible in a hempen cloth, and the whole afterwards placed in a common screw-press. A moderate pressure is now employed to press out the contained juice, which is allowed to run into a glazed earthenware vessel placed ready for the purpose, and at the top of which a sieve is put, so that the expressed juice is strained as it runs from the press, and thus before any deposit can have taken place, which we regard as a very desirable mode of procedure. Mr. Ransom informs us that he is very careful not to have much pressure exerted, for otherwise the elaterium is much deteriorated in quality, and as we have had an opportunity of seeing the cucumber after having been submitted to pressure, we observed that they were but moderately crushed, and hence the pressure employed could not have been very great, or they would have been reduced to a more pulpy condition. The juice as it runs



through the sieve is somewhat turbid, and of a greenish-yellow color. When the pressure has been continued for a few minutes, and the juice all run out from the pressed cucumber, it is poured into glazed earthenware jars, and allowed to stand for about twelve hours, by which time the whole of the elaterium will have been deposited in the form of a greenish, slightly yellow mass. (The time thus allowed for the deposition of the elaterium is much longer than that commonly adopted; thus, at Apothecaries' Hall about two hours are considered sufficient for the purpose, and at Mitcham the time allowed varies usually from three to four hours.) The supernatant liquor is then very carefully removed, and the deposit collected in a cloth. This deposit is then dried in a room heated by steam to a temperature of about 100° Fahrenheit, and the preparation of the elaterium is completed. The exact mode in which the supernatant liquor is removed and the deposit collected and dried, is a secret. In some places where elaterium is prepared, it is the custom to put aside the supernatant liquor and allow it to deposit again. The elaterium thus obtained is of a paler color and inferior in strength to the former. No use is, however, made at Hitchin of this supernatant liquor, but it is thrown away after the first deposit has been obtained. In fact, the time allowed for the first deposition is so long, that it is not likely that any further deposit would take place.

The amount of elaterium obtained from a bushel or forty pounds of cucumbers, is about three drachms. This accords very nearly with the experience of others. Thus, Mr. Arthur, of Mitcham, states that one bushel of fruit will yield about half an ounce, and Dr. Clutterbuck says that he obtained from half a bushel "less than two drachms of elaterium." We may fairly conclude, therefore, that half an ounce of good elaterium per bushel is about the ordinary yield, and that if a larger quantity be obtained, as is sometimes the case, that the excess is probably due to the use of too much pressure, and the resulting elaterium of inferior quality. We are informed, however, that the quantity of elaterium that can be obtained varies somewhat according to the weather in which the fruit is collected; thus, when the cucumbers are gathered in wet cool days, the yield is less than when they are obtained on a hot dry day.

The elaterium thus prepared at Hitchin is all sold to the wholesale druggists. We believe that much of the elaterium

prepared in this country is not used here, but that a great proportion is exported to America and the Continent, where it is much more frequently employed as a medicinal agent. We think it probable that elaterium would be much more employed as a medicine in this country could it be always obtained of uniform strength; but on account of the various modes employed for preparing it, and the adulterations to which it is liable, that is far from being the case; and with such a powerful medicinal substance as it undoubtedly is, such a want of uniformity leads to serious consequences. We consider it, therefore, very desirable to publish the processes of those who prepare good elaterium.

The elaterium, as thus prepared, is of a pale green color, with a slight yellowish tinge which become more apparent by keeping. It is in light, thin, slightly-curved pieces, which break readily and with a short fracture. It is readily reduced to powder when rubbed between the thumb and forefinger, thus proving the absence of any mucilaginous matter. It has a somewhat fragrant and agreeable odor, which is quite of a peculiar nature, for if it does not recall any other substance to us, although by some writers on materia medica the odor of elaterium has been compared to that of ergot of rye combined with the fragrance of senna or tea.—*Pharm. Jour.* Dec. 1859.

---

#### SACCHARATED LIME.

Lime dissolves in water in much larger proportion in presence of sugar, and this solution is strongly recommended as a tonic and antacid by Dr. John Cleland (*Edinburgh Med. Journ.*, August, 1859).

Dr. C. gives the following formula for its preparation:—

“Slake 8 ounces of quicklime; rub up with it 5 ounces of white sugar; add 1 pint of water; stir for some time, till the hard stiff masses which the sugar and lime are liable to run into are as much as possible dissolved; then filter. The product should be perfectly clear, and of only a slightly yellowish tint. A solution made in this way will contain 18 grains of lime in every ounce by weight, and altogether about 106 grains of solid matter to the ounce. Taken undiluted, a few drops are sufficient to roughen the tongue. When diluted, the taste is at first an

acid one of lime ; but this is immediately replaced by a sweet taste in the back of the mouth, admitted to be pleasant. Made as just recommended, the solution is not liable to decomposition unless it is exposed to the air. By employing a smaller proportion of water to lime, a still stronger solution may be obtained, but not with any practical advantage, as there is increased difficulty of filtration and greater tendency to decomposition."

This preparation, Dr. C. states, "is, of course, a powerful antacid, and probably the best we have, since it is stronger and pleasanter than magnesia, and does not weaken digestion like the alkalies. Far from doing so, its most important use is as a tonic of the alimentary system in cases of obstinate dyspepsia. As such, its action is much more powerful than that of the vegetable stomachic tonics. It is suitable for cases with too little as well as for those with too great secretion of gastric juice, no doubt because the former state of matters is obviously a result of atony, which the lime removes. It seems particularly serviceable in gouty constitutions. In the dyspepsia of hysterical and anemic cases it does not seem to be of great use. Care should be taken to tell the patient not to take it before breakfast, as it sometimes causes a degree of nausea in the morning, when the stomach is empty. It suits very well to take it immediately after meals ; its alkalinity does not at all interfere with digestion. Practitioners seem generally to take up the prejudice beforehand, that saccharated lime must be liable to produce constipation, probably judging so from the action of chalk ; but I wish particularly to insist that it has not, in the slightest degree, any tendency to occasion such an effect. On the contrary, it is a very valuable means of overcoming gradually that chronic constipation which is so frequent an accompaniment of dyspepsia ; and persons who have for years been in the constant habit of using aperient medicines have been able to abandon them in great measure after taking this remedy for some time. In a single instance it acted as a purgative, so that its use could not be continued. It will be found serviceable in checking the diarrhoea of disordered digestion, acting as lime-water does, only that the latter is so dilute that it is often impossible to administer it to adults in the quantity desirable. Patients who take saccharated lime habitually get to like the taste, and seem to think it exhilarating. It may be found useful also in

allaying the cravings of the intemperate. I have no doubt that, if it be fairly tried, practitioners will find it an exceedingly useful remedy. It may be given in doses of from 20 or 30 to 60 minims or more, in a glass of water, two or three times a day."—*Am. Journ. Med. Sec. Jan. 1860.*

## NOTE ON ARSENIC IN TRISNITRATE OF BISMUTH.

By MR. JOHN MORLAND, Analytical Chemist.

During the progress of Dr. Smethurst's trial, the presence of arsenic in commercial trisnitrate of bismuth was brought forward by the witnesses for the prisoner to account for the arsenic found by Dr. Taylor in one of the evacuations. Wishing to repeat the examination of trisnitrate of bismuth for arsenic, I obtained two samples of it from Pharmaceutical Chemists in the City; in both I found traces, though but slight ones, of arsenic. I was, however, surprised to find that both the samples contained chlorine; in one it corresponded to 72.5 per cent. of subchloride, in the other to 19.2 per cent. As the subchloride contains a larger percentage of bismuth than the subnitrate, it can scarcely be economical to substitute it for the latter; probably the finer powder obtained, together with the more easy solution of bismuth in aqua regia than in nitric acid, is the inducement. I understand that a subcarbonate is also prepared in London.

The above fact is not without a bearing on the presence of arsenic in the bismuth preparations, as arseniate of bismuth is barely soluble in nitric acid, whilst in hydrochloric acid it is freely dissolved, and reprecipitated with the subchloride on the addition of water. To prove this, I prepared subnitrate and subchloride of bismuth from metallic bismuth, to which a large quantity of arsenious acid had been added; the solutions, as ordered by the Pharmacopœia, were both filtered before precipitation by water, and resulting subsalts tested for arsenic; there was only a trace in the subnitrate, whilst in the subchloride it was abundant, as also in subcarbonate prepared from the chloride.

Mr. JOHN HUSKISSON, jun., observed that, considering the way in which subnitrate of bismuth was usually prepared, there could not be more than a mere trace of arsenic in it. The

metallic bismuth was first roasted at its fusing point, during which process the arsenic, which volatilizes at about  $367^{\circ}$ , was driven off. The purified bismuth was then dissolved in nitric acid, and the nitrate obtained in crystals. These crystals were afterwards decomposed by the addition of water, and the subnitrate was thus obtained, while any arsenic that might have escaped volatilization in the roasting would be left in the mother liquor from which the subnitrate was precipitated.

Dr. REDWOOD thought the process described by Mr. Huskisson was better than that given in the Pharmacopœia, and he approved of using the crystals rather than the acid solution of nitrate of bismuth for precipitating with water, as the product would be less liable to variation. He did not think, however, that the roasting of the metal could be depended upon for the removal of the whole of the arsenic, nor did he consider the subnitrate, in whatever way prepared, a satisfactory preparation. He thought, it might, with advantage be replaced by the subcarbonate.

Mr. MORLAND inquired of Mr. Huskisson how he accounted for the presence of chlorine in the subnitrate of bismuth of commerce.

Mr. HUSKISSON said there were two compounds of bismuth prepared by manufacturers—the subnitrate or trisnitrate, which was used in medicine, and the oxychloride, for the preparation of which every manufacturer had a process of his own, and of which large quantities were used in the arts, as an ingredient in enamel, as a cosmetic, and in the preparation of sealing-wax. As the oxychloride was more expensive than the subnitrate, he thought its substitution for the latter must have been the result of accident, or probably the person selling it thought, as it was not ordered for medicinal use, that it was required as a pigment, and therefore that the oxychloride was the sort wanted.

The CHAIRMAN confirmed what had just been stated with reference to the oxychloride of bismuth, which he said, with far more extensively used than the subnitrate, especially in the manufacture of white sealing-wax. He thought the subcarbonate of bismuth a better preparation than the subnitrate, and less likely to be impure.—*Pharm. Journ. and Trans.* Jan. 1860.



## ON LIQUOR FERRI IODIDI, AND THE TESTS OF IODINE.

BY FERDINAND F. MAYER, OF NEW YORK.

In laying the following remarks before the meeting, I must state that some of the facts I shall mention are truly enough not new; but as I have endeavored to arrange and harmonize them with my personal observations, they may contribute much to the understanding of the changes which this preparation is liable to, and of the remedies proposed for their alleviation.

First, as to the strength of the liquor. I have made this preparation by all the formulas given in the different Pharmacopœias and books, some with a greater or less excess of iron, some with iron wire, others with filings, some with application of heat, others without; some filtered into sugar, others into syrup—but in not a single instance have I found them to contain fully the proportion of iron corresponding to the amount of iodine employed.

The solution, always directed to be made by digesting iodine and iron in varying proportions, is of an acid reaction. It is thus not only shown by the test on blue litmus paper, which might possibly and partly be supposed to arise from the action of the iodide on the organic substance, but also by the continued disengagement of hydrogen gas, if ever so slow, going on in the solution when digested at a higher temperature with clean iron wire or metallic zinc. That a formation of hydriodic acid takes place during the reaction, in the first place, of iodine on iron is made quite perceptible by the smell of carburetted hydrogen arising from the mixture, especially when heated or made from filings. This excess of hydriodic acid in no case amounts to more than two per cent. of that in combination, but is in no other way injurious to the preparation. A deficiency of iron is further caused by the never-wanting impurities of iodine. I shall further on return to the tests of this substance.

The strength of the official solution in iodide of iron should be set down as seven grains per ounce.

The large excess of iron used does in no way contribute to increase the proportion of it going into solution. It rather causes a loss of iodine by inducing too rapid a combination and evolution of heat. The ingredients should be kept as cool as possible, though it may require a little more time. Application of

heat will always drive off a portion of iodine; and much more sesquioxide of iron will be found suspended in the liquid after heating.

The use of iron filings should be discarded. Not only that they are objectionable on account of the impurities which they unavoidably contain, but their action on the iodine is far too rapid, even when no heat is applied. An admixture of brass filings, which must have been in use in the coppery preparation, examined by Mr. Maisch some years ago, is by no means uncommon.

It is of some importance that the water employed should be free from organic matter and air. Distilled water is directed to be used; but I venture to say, this direction, as in most other instances, is but rarely followed. There is somewhat of an excuse for the scarcity of distilled water in the shops, from the fact that it costs far more than would balance the advantages derived from its use in many preparations. But, why not use melted ice? It is strange that so excellent a substitute for distilled water has hardly ever been mentioned. The writer has been using it during the whole summer for the same purposes, and never found it to act in the slightest degree on nitrate of silver or baryta. It is best prepared by melting clean, transparent pieces of ice in a glass jar, and drawing off by means of a siphon, from what sediment may have formed during melting. I would recommend this to the consideration of the Association, since, throughout the whole country, ice has now become so common an article for domestic use, that pure water will be within the reach of every one, if its production in the manner indicated is once admitted as a fact.

The mixing of the ingredients should not take place in a porcelain dish, but a glass flask or vial, since no heat from without is required to induce their action on each other. Of the recipes published for this preparation, none appears to answer so well as that given by Dr. Squibb, (vide Proceedings for 1858,) principally by the manner in which the fresh solution is protected from the action of air from without, and that in the sugar. This one cause of the changes, which the saccharine solution undergoes, is most effectually removed by filtering into syrup. But not the action of the air, which afterwards comes into contact with the liquor, from the surface downwards. I have as yet not

seen a liquor of Syrupus Ferri Iodidi which did not turn brown when the bottle containing it was frequently opened or left open.

The following experiments were made as continuing those of Mr. Maisch, published in the American Journal of Pharmacy of 1854. I merely give the results of the different tests, the details being too lengthy. The solutions were all made with chemically pure iodine and fine iron wire.

*The officinal Liquor Ferri Iodidi contains free hydriodic acid, and the quantity of iron in solution is not sufficient to bind all iodine.*

*Cane sugar is completely changed to grape sugar by heating with dilute hydriodic acid.* Freshly prepared simple syrup, diluted with water and heated with a small quantity of hydriodic acid, a portion of the liquid precipitated by nitrate of silver and filtered, the excess of silver removed by carbonate of potassa, and the filtered liquid added to a hot alkaline solution of potassio-tartrate of copper,—showed the distinct reaction of grape sugar, that is, precipitation of suboxide of copper. To judge from the test with ferri cyanide of potassium, as lately given by Anthon, no cane sugar was left in the liquid.

*Cane sugar is changed to glucose with hydriodic acid, and the light and heat of the sun acting together.* The qualitative tests were made as above, and showed the presence of grape sugar, but only in a small proportion.

*Hydriodic acid dissolves a large amount of hydrated sesquioxide of iron, forming a yellow solution, and a deep blue precipitate with ferro cyanuret of potassium.* On heating, it turns pale under escape of iodine, and then precipitates a paler blue. When cane sugar is present, it is converted into glucose.

*The browned Liquor Ferri Iodidi heated with hydriodic acid or iodine is brought back to its original color with disengagement of iodine and formation of grape sugar.* It then gives a pale blue precipitate with ferro cyanuret of potassium, which turns dark rapidly. To find the presence of any acid besides hydriodic, I precipitated part of the bleached liquid with nitrate of silver, washed the precipitate, and decomposed it by digestion with metallic zinc. The solution of zinc, which should contain all the iodine previously combined with the silver, was precipitated by carbonate of soda, and the alkaline solution tested for iodic

acid, qualitatively and quantitatively. It showed no formation of iodine by the addition of hydrochloric acid, but some was set free by sulphuric acid. The first test is conclusive as to the absence of iodic acid, the latter reaction takes place with all iodides, whether an iodate be present or not. I determined the quantity of iodine present by oxidation with a graduated solution of hypochlorite of soda. The amount found corresponded precisely with the quantity of the silver contained in the precipitate.

I conclude from this absence of iodic in the decolorized liquor prepared from pure iodine, that the sample examined by my friend Maisch, had been made from iodine containing a small portion of chlorine. This is a very common admixture, and very few samples of iodine will be found, which, when water is poured on, do not at once give a brownish solution, owing to the presence of chloride of iodine.

The change which takes place on exposing Liquor Ferri Iodidi to the air is owing to the action of atmospheric oxygen on the protoxide in solution, precipitating a basic hydriodate of the sesqui-oxide of iron, and setting free some hydriodic acid, which in connection with the acid of the solution, partly decomposes again some of the sesqui-oxide, forming protoiodide and free iodine. When this brown liquor is heated in a porcelain dish, its color becomes lighter in the measure as the free acid decomposes the sesqui-oxide, and the iodine is dissipated. It turns colorless if hydriodic acid or iodine be added while boiling. *It may be evaporated to dryness in a salt bath, allowing a slight excess of iodine to be present during the whole of the evaporation, and it will again be perfectly soluble in water, yielding a green precipitate with potassa.* During the heating, most if not all the cane sugar of the solution is converted into glucose. A similar reaction takes place when the stoppered bottle containing the brown liquor is exposed to the direct rays of the sun. Here the formation of glucose by hydriodic acid takes place, though not as complete as in the open dish; but it super-induces the action of the acid on the suspended sesqui-oxide, which is there by completely converted into protoxide, its oxygen and the hydrogen of the acid being taken up by the sugar.

That sesquioxide of iron is dissolved by hydriodic acid and converted into protoxide by heating the solution, is an old fact, and a number of very delicate volumetric methods are founded

on this reaction. Any one may repeat the experiment with a dark liquor ferri and a small quantity of iodine, tincture of iodine, or iodide of potassium. The result will in all cases be a protosalt of iron. Acting on this principle, the evaporation of the solution in water will be rendered more simple, and will furnish a perfectly soluble salt, if, during evaporation, a small excess of iodine be directed to be added.

But even though the Liquor Ferri Iodidi when heated with iodine may have lost none of its original qualities, its permanency is hardly better than before. Nor does the presence of bright iron wire in the syrup appear to prevent the separation of sesqui-oxide. Among the deoxidizing substances within our reach, there is, however, one, the chemical and medicinal properties of which are by this time well understood, which in analysis is frequently employed to act either on iodine or sesqui-oxide of iron, and which, besides, is very cheap,—I mean the *Hyposulphite of Soda*. You will find among the preparations submitted to the inspection of the meeting a bottle labelled "Protoiodide of Iron, without Sugar." It is, or ought to be, a perfectly limpid, pale green liquid, containing the same proportion of iron as the officinal liquor, but one-sixteenth more than the amount of iodine. It is prepared as follows:—

Take of Iodine,	two ounces and one drachm.
Fine Iron Wire,	six drachms.
Pure Water,	q. s.
Hyposulphite of Soda,	two drachms.

Place two ounces of the iodine with five ounces of water in a glass flask or prescription bottle, add the iron gradually, and shake, unless the mixture becomes too warm, until a pale green solution is obtained. This pour off into a tincture-bottle marked at the point indicating twenty fluid ounces. Add the last drachm and agitate until dissolved. Rinse out the first flask with some water, which is added to the iodine solution. Then dissolve the hyposulphite of soda in enough cold water, and add it gradually to the solution of iron until the latter, under shaking, is discolored. Dilute to twenty ounces, and filter in a glass-stopper bottle. If two drachms of hyposulphite are insufficient to discolor, it is a proof of its impurity, and more should be added until the result is attained. If too much has been added,



it will precipitate some very finely-divided sulphur, which may be redissolved by the addition of a little iodine. The solution, before filtering, is best left standing over night, when all excess of hyposulphite will have been decomposed by the free hydriodic acid present.

The excess of iodine and the hyposulphite of soda are added in equivalent proportion, in which they form hydriodic acid and tetra-thionate of soda, the salt of the acid which does not precipitate the salts of baryta. This soda-salt is perfectly inert, but insures the permanency of the proto-iodide to a remarkable degree. It may be passed through a number of filters without being oxidized. It may be sweetened by substituting syrup for part of the water, which, however, does not improve its appearance or permanency. The dose need not be reduced from that of the officinal, though containing slightly more iodine.

In addition to the above remarks, the writer will give what appears to him much needed in our Pharmacopœia; that is, simple qualitative and quantitative tests for iodine and iodide of potassium.

The presence of water and cyanide of iodine in commercial iodine is found by the tests described in the Dispensatory. The presence of chlorine must be suspected when the iodine imparts a brown color to water. It is found by heating a strong solution of a neutral persulphate of iron, (iron alum,) free from chlorine, with the iodine, until no iodine appears to be dissipated, when the solution of iron will give a precipitate with nitrate of silver if chlorine was present in the iodine.

We have two very accurate tests for free iodine, founded on the oxidation of arsenite of potassa to arseniate, and of hyposulphite of soda to tetra-thionate.

A test solution of arsenite of soda or potassa, for the use of the pharmacist, is prepared after the manner directed for Fowler's Solution, using 70 grains of acid and 140 of bicarbonate of potassa to one quart or two pounds (avoirdupois) of test-liquid. The iodine to be examined, say five grains accurately weighed, is placed in a porcelain mortar with a little bicarbonate of potassa or soda, and a drachm or so of the solution of arsenite from a vial previously tared on a balance. A few drops of a solution of starch are then added, and rubbed up with the

iodine, and then the solution of arsenite slowly, and towards the end drop by drop, until the blue color of the starch all at once disappears. The difference in the weight of arsenite of potassa is then an accurate measure of the quantity of pure iodine. One hundred grains of the solution are equivalent to 1.269 grains of pure iodine.

The solution of hyposulphite of soda is prepared by dissolving 350 grains of the salt in water, and dilute to one quart or two pounds avoirdupois. The iodine, when to be examined by this test, must first be dissolved in iodide of potassium, after which the reaction goes on as with arsenite of potassa; one hundred grains being equivalent to 1.269 grains of pure iodine. These solutions are very dilute, and by the comparative largeness of the dose needed for small quantities of iodine, a great margin is left. The above solution of arsenite serves as a measure for hypochlorite of soda, chlorine and chloride of lime. It is added to a known quantity of these substances, until a drop of the mixture ceases to produce a blue spot on white paper sized with iodide of potassium and starch.

Regarding the qualitative tests of iodide of potassium treated on in the Dispensatory, it must be added that the solution of the salt must be dilute when tested with sulphuric acid and starch; for strong solutions disengage the iodine at once. The test described for chlorine contained in iodine is equally as well applied to iodide of potassium. The persalt of iron must be perfectly free from chlorine. The resulting solution of iron treated with chlorine water and ether shows bromine, if present. In Personne's test for bromide, the sulphurous acid is advantageously replaced by hyposulphite of soda. Iodate of potassa is present when, on the addition of pure hydrochloric acid, free iodine makes its appearance.

The quantitative test of Marozeau, as described by Mr. Maisch some years ago, is sufficiently accurate for the purposes of the pharmacist. The quantity of iodate in a sample is found by adding some hydrochloric acid, and determining the quantity of iodine set free by the solution of hyposulphite of soda, described above. For each six equivalents, or 7.6 (seven  $\frac{6}{10}$ ) parts of iodine found, put 2.14 parts of iodate of potassa.—*Proc. Am. Pharm. Assoc.*, 1859.

## FLUID EXTRACT OF BURDOCK.

BY ISRAEL J. GRAHAME.

Some demand for this preparation, having arisen in the establishment of the writer, and not finding a published formula for it, the following is suggested as productive of a result every way satisfactory.

It is believed that this fluid extract might be advantageously substituted for that of sarsaparilla, as a more efficient and reliable alternative, or at least as a valuable addition to it.

Take of Burdock, in powder, No. 50, . . . sixteen ounces.

Diluted Alcohol (Alcohol  $4\frac{1}{2}$  parts, Water  $3\frac{1}{2}$  parts,) a sufficient quantity.

Dampen the powder with the menstruum and pack it in a suitable glass displacer; having covered the surface with a piece of muslin or perforated filtering paper, pour on the menstruum and continue the percolation to exhaustion, reserving one and a half ounce of the first runnings, evaporate the remainder over a water bath until reduced to nine fluid ounces, to which add four ounces of sugar and dissolve. Strain, if necessary, and add the reserved portion.

The dose of the extract is one teaspoonful, representing eighty grains of the root.—*Journ. and Trans. Med. Col. Pharm.*

## ON ISOMERIC ALKALOIDS.

BY C. GREVILLE WILLIAMS.

While investigating the organic alkaloids produced by destructive distillation, I was struck by the almost entire coincidence of the formulæ of the bodies found from the most opposite sources. Thus coal, bituminous shale, Dippel's oil (bone oil), and cinchonine, all appeared to yield alkaloids belonging to the same series. But although the composition of the same alkaloids from each source was identical, and even their boiling points agreed as well as could be expected, yet there were differences in the smell, power of forming crystalline salts, &c. which presented themselves during the course of these long investigations, and at times almost induced a belief that I was

dealing with isomers instead of identical bodies. The greatest differences were found with the bases produced by destructive distillation of cinchonine. Here the odor of the alkaloids was so different to that of the same bodies extracted from other sources that I long oscillated between two opinions. However, the resemblances were too numerous to justify me in announcing the pyridine series, as obtained from cinchonine, to be a new class of alkaloids. In fact, the absence of absolutely distinct reactions rendered such a course impossible. I have, however, at length discovered a reaction with the chinoline series as obtained from cinchonine, which is so totally different from anything which can be obtained with the chinoline series from coal tar, that I am fully persuaded of their being essentially different.

Chinoline, or lepidine from cinchonine, was boiled with iodide of amyle for a few minutes, after which water was added, and the boiling continued for a short time. The product was a brown oily looking fluid suspended in the water. A little ammonia was now poured in, and the boiling continued for a short time longer, when the whole of the oil became converted into a magnificent blue color of the utmost intensity. It dissolves readily in alcohol, and the diluted fluid dyes silk of a fast and most brilliant blue, having a slight shade of purple.

So strong is the attraction of silk for the dye that the bath becomes colorless, every trace of color being taken up. It has but small tendency to unite with cotton, for if the latter, after being dyed blue, be boiled with silk, the cotton becomes colorless and the silk absorbs all the color.

The coal tar bases of the same composition present nothing similar. They may, it is true, be made to yield superb coloring matters, but by totally different modes of procedure.

I am at present endeavoring to ascertain whether the pyridine series from cinchonine possess any features sufficiently distinct from the same series as extracted from coal, to justify the conclusion of their being a distinct class.—*Chemical News*, Dec. 17, 1859.

## Varieties.

---

*A Substitute for Lint.*—Mr. J. R. A. Douglas, formerly house surgeon, Middlesex Hospital, in a letter to the *Lancet*, July 23, recommends the following substitute for lint, which is in extensive use in the Parisian hospitals:—"I have Anglicised it by the name of 'pink,' as pinking is the process by which it is made. It is merely cheap cotton perforated by a common punch. The long-cloth is folded some fourteen times, and holes are driven through it with a hammer and a sixpenny punch on a piece of lead. The holes are about one-eighth of an inch in diameter, and twice their breadth from each other. My firm having been for many years surgeons to Messrs. Curtis and Harvey's powder-mills, I have had opportunities of testing it in burns and other large suppurating surfaces. These being extremely sensitive, do not require the removal of the pink so frequently as lint or other applications, as the pus passing through the perforations is easily removed with a soft sponge, which cannot be done with other applications, nor will the highly vascular granulations in burns bear the sponge when uncovered. I have found it very useful in gun-shot wounds, and in compound fractures, where, as a perforated bandage, it gives support without confining the discharge, which never accumulates under it; and when removed, the surface is covered with healthy lymph without pus. Mr. Ashbee, the intelligent manager of Messrs. Curtis's powder-mills, has promised to prepare some linen or cotton by their elaborate machinery, if possible; in the meantime, the hospital patient, nearly convalescent, would be grateful for the occupation to relieve his monotony, and the cheapness of material and instruments makes it worthy of trial. Any ointment may be spread on it; and where large pieces are used, it can be rewashed.—*Chemist and Druggist*, Sept. 1859.

---

*For Bleaching Ivory.*—The process for bleaching bone and ivory is as follows: the bone or ivory is first to be rubbed with pounded pumice-stone and water, and then placed moist under a glass shade, which must be well luted to the stand at the bottom, and exposed to the heat of the sun. The sun's rays, without the glass shade, would be likely to produce fissures or cracks in the bone or ivory. The moist rubbing and exposure may be continued until the desired whiteness is attained. Beasley says a solution of sulphuric acid will bleach ivory.—(Correspondent.)—*Chemist and Druggist*, Jan. 1860.



*Chlorodyn.*—Dr. Ogden requests the following formula to be used in preference to the one published in your October number—*Chlorodyn*:—

R Chloroformyli, f3vj.; Æther Chlor. f3j.; Tinct. Capsic. f3ss.; Olei. Menth. Pip. gr. ij.; Morphiae Hydrochlor, gr. viii.; Acid. Hydrocyan. (Sch.) gr. xij.; Acid. Perchloric, gr. xx.; Tinct. Can. Indicae, f3j.; Theriacae, f3j.; Misce.

The importance of the medical profession knowing what they prescribe, needs no comment.—*Ibid*.

---

*Soluble Glass.*—Fuch's soluble glass is made by heating together 15 parts pure sand, 10 carbonate of potash, and 1 of charcoal. This can be dissolved in 4 or 5 parts of boiling water, which should be then evaporated to the specific gravity 1.24.—*Ibid*, Dec. 15, 1859.

---

*Proposed New Weights for Use in Pharmacy.*—Mr. Squire laid before a recent meeting of the Pharmaceutical Society a set of avoirdupois weights, with the equivalent in grammes marked upon each weight. He had previously drawn the attention of the society to the comparative values of troy and metrical weights, but as it was now probable that the avoirdupois weight would be adopted in the forthcoming Pharmacopœia, with a reference to the equivalents in grammes, it was desirable that pharmacutists should make themselves acquainted with the relations existing between them.—*Chemist and Druggist*, Dec. 15, 1859.

---

*Mauve Dye.*—This exquisitely beautiful dye for silks is prepared by taking equivalent proportions of sulphate of aniline and bichromate of potash, dissolving them in water, mixing, and allowing them to stand for several hours. The whole is then thrown upon a filter, and the black precipitate which has formed is washed and dried. This black substance is then digested in coal-tar naptha, to extract a brown, resinous substance; and finally digested with alcohol, to dissolve out the coloring matter, which is left behind, on distilling off the spirit, as a coppery friable mass. This is the dyeing agent, producing all the charming varieties of purples known by the name of mauve, which, as it appears to us somewhat inappropriately, has been given to this color. The particularity of these purples consists in the peculiar blending of the red and blue of which they are constituted. The permanence of these hitherto fugitive combinations is their strongest recommendation.—*Ibid*.

---

*Native Country of the Potato.*—In speaking of the potato, Dr. Weddell has recently made the following interesting remarks:—

"I never found the potato in Peru so circumstanced as to satisfy me that it is really wild in that country. Neither do I believe that it is

wild in the distant stations on the extra-Chilian Alps where it has hitherto been thought so. When we consider that on the arid Cordilleras the Indians often fix their patches of cultivation on points that would appear almost inaccessible to our European farmers, it is easy to imagine how a traveller visiting one of these stations which had been long abandoned, and finding the potato accidentally surviving, would conclude that it must be really wild there. But where is the proof? For my own part, after reading all that has been written on the subject, I am forced to conclude that its real native country is Chili rather than Peru. There can be no doubt that the cultivation of the potato is of great antiquity, seeing that at the time of the conquest it was found in every part of the temperate portions of Western America from Chili to New Grenada and even Mexico, and I am very much inclined to think that it was everywhere the same species; for although the potato grown on the high plains of Peru possesses some degree of acidity, and resists frost better than those with which we are familiar, it does not appear from its botanical characters that it can be distinguished as a species rather than a simple race.—D'Orbigny brought from the summit of the Cerro de Potosi, and consequently from an elevation of 14,640 feet, a form of the potato which might be called Alpine. The leaves grow in rosettes and the flowers sit perfectly close upon the root. I found the same form in a piece of ancient cultivated ground on the Peruvian plateau at the height of 12,000 feet."—*Lon. Pharm. Jour.*, Dec. 1859.

---

*Metallic Cement.*—M. Greshiem states that an alloy of copper and mercury, prepared as follows, is capable of attaching itself firmly to the surfaces of metal, glass, and porcelain. From 20 to 30 parts of finely divided copper, obtained by the reduction of oxide of copper with hydrogen, or by precipitation from solution of its sulphate with zinc, are made into a paste with oil of vitriol and 70 parts of mercury added, the whole being well triturated. When the amalgamation is complete, the acid is removed by washing with boiling water, and the compound allowed to cool. In ten or twelve hours it becomes sufficiently hard to receive a brilliant polish, and to scratch the surface of tin or gold. By heat it assumes the consistence of wax, and, as it does not contract on cooling, M. Greshiem recommends its use by dentists for stopping teeth.—*Ibid.*

---

*Cleaning Glasses and Capsules.*—There is often a difficulty in cleaning glasses or porcelain capsules to which organic matters have adhered, and in course of time become so hard and dry that they resist all solvents. The following process will be found to answer in almost every case:—

The spots to be cleaned are moistened with concentrated sulphuric acid, and powdered bichromate of potash is sprinkled upon the acid; the objects are then left standing for some hours (through the night) in a moderately

warm place. All organic matters are by this means destroyed, with formation of sulphate of chromium, which may be removed by water with the residue of the acid.—*London Pharm. Journ., from Dingler's Polytechn. Journal.*

---

*The Tea Tree in India.*—Mr. Henry Mann, an enterprising gentleman who left China about five years ago, has introduced the tea tree to Southern India, having formed a plantation on the Neilgherries, which is now flourishing. The Madras Government has lately published an interesting report upon the subject. The plantation is situated about two miles and a half above Coonoor, at an elevation of 6000 feet, with an exposure to the north-east, and contains about 6000 plants. The ground occupied is about four acres. The plantation is on a slope. The forest land is found most suitable for the plants. It now only remains to test the leaf and to procure skilled manufacturers. This the Government was asked to do by the Conservator of Forests, but the application has been refused on the grounds of the inexpediency of Government interference with private enterprise. The importation of skilled manufacturers on speculation will not probably be ventured upon by any private individual for many years. The cultivation of tea in the hill districts of India seems to be spreading fast, and as these are the localities recommended for European colonization, we may yet see India rivalling China in this trade, and sturdy Anglo-Saxon pickers depicted on the tea chests instead of almond-eyed, long-tailed men of China.—*Ibid.*

---

*A New Plaster.*—M. Pasquier, of Roubaix, has exhibited to the Academy leaves of gutta-percha mixed with peroxide of iron, which he has long employed in the dressing of fractures and complicated wounds. The leaves soften in boiling water, and may be then readily applied around the limb, around which they become moulded, and lose none of their consistence through the heat of the body. After amputation he uses nothing but this gutta-percha—neither charpie, compress, or bandage.—*Ibid.*

---

*Production of French Perfumes.*—The chief places of their production are the south of France and Piedmont, namely, Montpellier, Grasse, Nîmes, Cannes, and Nice; these two last, especially, are the paradise of violets, and furnish a yearly produce of about 13,000 lb. of violet blossoms. Nice produces a harvest of 100,000 lb. of orange blossoms, and Cannes as much again, and of a finer odor. 500 lb. of orange blossoms yield about 2 lb. of pure Neroly oil. At Cannes the acacia thrives particularly well, and produces yearly about 9,000 lb. of acacia blossoms. One great perfumery distillery at Cannes uses yearly about 140,000 lb. of orange blossoms, 20,000 lb. of acacia blossoms (*Acacia Farnesiana*), 140,000 lb. of rose leaves, 32,000 lb. of jessamine blossoms, 20,000 lb. of violets, and 8,000 lb. of tuberoses, together with a great many other sweet herbs. The ex-

traction of the ethereal oils, the small quantities of which are mixed in the flowers with such large quantities of other vegetable juices that it requires about 600 lb. of rose-leaves to win one ounce of otto of roses, demands a very careful treatment. The French, favored by their climate, are the most active, although not always the most careful, preparers of perfume; half the world is furnished by this branch of their industry.—*Ibid.*

---

*The Extraction of Potato Starch.*—In the manufacture of this article a considerable quantity of the product is lost owing to the strong affinity the starch has for the fibre of the potato. From M. Anthon's experiments on the subject, it appears that the manufacturer only extracts two thirds, and that the remaining third is left in the pulp. M. Anthon suggests that this third may be utilized by converting it into sugar, by means either of malt or dilute sulphuric acid. By employing 10 per cent. of the acid to the dry fibre, the saccharification is completed in about two hours and a half; but if only 3 or 4 per cent. of acid is used, the boiling must be continued for at least five hours. Ten per cent. of malt effected the conversion in six hours. The result as to the quality and quantity of sugar produced is the same whether it is obtained by malt or sulphuric acid.—*Chem. News, from Chemisch Central Blatt, 1859.*

---

*Cubilose.*—M. Payen has submitted to a chemical examination, the substances contained in the bird's nests which are used by the Chinese as an aliment, and form among the Oriental nations the object of a large commerce. These nests, as is well known, are constructed by a species of swallow, which the French term *Salangane*. The quantity of nests exported yearly from the Indian archipelago is estimated at 242,000 lb. English. The value of the substance is from 100 to 150 francs a pound. In Paris, these swallow nests sell sometimes as high as 400 francs a pound, or 5 or 6 francs per nest. They are sold ready for eating. Many naturalists think that the nests are composed of the spawn of fish, or of a mixture of various zoophytes; others think they are made of a certain juice which exudes from some unknown tree, or that they are constructed with lichens and gelatinous algæ. It appears certain, however, that the swallows produce at the time of nidification a mucilaginous liquid, secreted from their salivary glands, or by the glands of one of their stomachs, in the same manner that the swallows of Europe secrete a viscous liquid with which they cement together the materials of their nests in the window corners of our houses.

M. Payon's investigations show that such is the case; the agglutinative and alimentary principle of the *Salangane's* nest sometimes forms the greater part, or even the whole of the nest, and is a peculiar secretion analogous to animal mucus containing nitrogen (9.52 per cent) and sulphur, devoid of organisation, sinking in water, and dissolving almost en-

tirely in hot water, taking an orange color with iodine, soluble in diluted and warm alkaline solutions, &c. To this new immediate principle, the author has given the name of *cubilose*, which implies the use and natural state of the secretion in question.—*Chem. News*, Dec. 24, 1859.

*Solubility of Alkaloids in Olive Oil.*—We have already furnished our readers, Pettenkoffer's experiments on the solubility of alkaloids in chloroform (page 17 of this volume). We now furnish the result of his observations on their solubility in olive oil. It is suggested such solutions might be employed instead of pomatums or ointments for external application of these agents.

100 parts of olive oil, at ordinary temperatures, will dissolve of

Morphia,	0.00 parts.
Narcotina,	1.25 "
Cinchonia,	1.00 "
Quinia,	4.20 "
Strychnia,	1.00 "
Brucia,	1.78 "
Atropia,	2.62 "
Veratria,	1.78 "

*Jour. de Pharm.—Journ. and Trans. of Md. Col. of Pharm.* Dec. 1859.

*Detection of Plumbago in Iron reduced by Hydrogen.*—M. Liénart has found that the *pulvis ferri*, or iron reduced by hydrogen for medicinal purposes, is sometimes sophisticated with plumbago or black lead. This fraud is easily detected by dissolving the iron first with weak sulphuric acid, and terminating the operation with aqua regia; the plumbago remaining can be collected upon a filter and examined. The author has found as much as 14 per cent. in some specimens.—*Chem. News*, Dec. 10, 1859.

*Reinsch's Test for Arsenic.*—In experimenting on different solutions of the salts of arsenic by Reinsch's test, it is very important to know that there is a considerable difference in point of time before the copper wire becomes coated with Arsenic. The *Arseniates* show it almost the instant the liquid boils; whereas the *Arsenites*, or more highly oxidised salts, require a longer time and greater degree of concentration before any deposit is obtained. A knowledge of this fact may prevent an erroneous conclusion being drawn as to the presence of arsenic, although it may not be immediately detected.

In combination with chlorates, as proved by Dr. Taylor in Smethurst's case, no deposit is obtained, the arsenic remaining in solution; whilst the copper is dissolved, and imparts a blue color to the liquid.

The delicacy of Reinsch's test has been greatly underrated by Taylor, Brande, and others, who state that arsenic fails to be detected when dilu-



ted to 120,000 times its bulk. How such a mistake should occur I cannot imagine; since, in accurate experiments lately made by me, I have detected it at a dilution of 560,000 times; and when at 280,000 times, the layer is so strong as to be fit for sublimation, having a bright steel color: at 560,000 times, however, the deposit is more of a violet color. These experiments were made by dissolving a grain of arsenious acid in a pint of distilled water, and diluting from time to time.

Compared with arsenic no deposit of antimony from a solution of tartar emetic took place at either of these points of dilution.—*J. Horsley, F.C.S.—Chem. News, Dec. 10, 1859.*

#### PHARMACOPŒIA CONVENTION OF 1860.

The following appointments of Delegates to the Convention for revising the Pharmacopœia, to meet at Washington on the first Wednesday of May next, having been duly made known to me, are hereby announced, in compliance with a provision of the Convention of 1850.

From the Massachusetts College of Pharmacy, Messrs. THEODORE METCALF and CHARLES T. CARNEY; from the New York Academy of Medicine, B. W. MCCREADY, M. D., E. H. DAVIS, M. D., and E. R. SQUIBB, M. D.; from the College of Physicians of Philadelphia, GEORGE B. WOOD, M. D., R. P. THOMAS, M. D., and ROBERT BRIDGES, M. D.; from the University of Pennsylvania, JOSEPH CARSON, M. D., R. E. ROGERS, M. D., and JOSEPH LEIDY, M. D.; from the Jefferson Medical College of Philadelphia, FRANKLIN BACHE, M. D., and T. D. MITCHELL, M. D.; from the Philadelphia College of Pharmacy, Messrs. WILLIAM PROCTER, Jr., EDWARD PARRISH, and ALFRED B. TAYLOR; and from the Medical Society of the State of North Carolina, WM. GEO. THOMAS, M. D., PETER E. HINES, M. D., and EDWARD WARREN, M. D.

By order of the Convention of 1850.

GEO. B. WOOD, M.D., *President.*

*Philadelphia, Feb. 14th, 1860.*

As we were going to press, the following communication was received from Dr. Wood:

"Since my former communication, the following appointments of Delegates have been announced to me:

From the Medical Society of the State of New York, Drs. E. R. SQUIBB HOWARD TOWNSEND, and CALEB GREEN; from the College of Pharmacy of the City of New York, Messrs. WM. HEGEMAN, ALEX. CUSHMAN, and JOHN MEAKIM; from the Faculty of Physic of the University of Maryland, Profs. SAMUEL CHEW, CHARLES FRICK, and WM. E. A. AIKIN; from the Maryland College of Pharmacy, Messrs. G. W. ANDREWS, ISRAEL J. GRAHAME, and ALPHEUS S. SHARP; and from the Cincinnati College of Pharmacy, Messrs. E. S. WAYNE, W. S. MERRILL, and W. J. M. GORDON.

GEO. B. WOOD.

*Feb. 23d, 1860."*

[Medical and Pharmaceutical Journals will please copy.]

## Editorial Department.

---

**PHARMACOPŒIA CONVENTION.**—By reference to page 186, our readers will find an Announcement by Dr. Wood, of the next Meeting of the Convention for Revising the Pharmacopœia. The great importance of this Convention in giving authority to the National Pharmacopœia should induce a general attendance of delegates from the authorized Medical and Pharmaceutical bodies. There are certain points in regard to the new edition which should be discussed in the Convention at large, such as Weights and Measures, the Process of Percolation, the general opinion regarding the extent to which Fluid Extracts should be introduced, &c., that the committee to whom the labor of revision is committed shall have some idea of the wishes of the profession at large. It would be well if the President of the Convention would ascertain from the Washington delegates the place of meeting in Washington, and have it announced in the Journals for April and May, so as to avoid the annoyance to stranger delegates of not knowing where the Convention is to assemble.

---

**THE JACOB BELL MEMORIAL.**—The universal respect and admiration of the character of the late Jacob Bell, President of the Pharmaceutical Society of Great Britain, among the Pharmaceutists of England and Scotland, has vented itself in the idea of establishing a memorial in the form of two Scholarships in the School of Pharmacy of that Society, and already about \$8000 have been subscribed for the purpose intended. Even the London College of Physicians have taken part in it, and have expressed their approval of the plan. No more appropriate offering could have been suggested in honor of a man whose sacrifices and devotion to his profession are perhaps unrivalled in the annals of Pharmacy; certainly none which would have been more in consonance with the feelings of the honored dead.

---

**MODES OF RENDERING COTTON FABRICS NON-INFLAMMABLE BY SALINE IMPREGNATION.**—Much attention has recently been attracted to this subject, owing to the frequent loss of life by the combustion of female dresses which has occurred in Great Britain. The Queen having set the example by practical experiments in the "Royal Laundry," made with solutions prepared under the direction of a scientific gentleman, others are now taking hold of the idea. We had intended to have published an account of the result thus far, in this number, but for want of space defer it till our next.

St. Louis, Mo., Feb. 10th, 1860.

To the Editor of the American Journal of Pharmacy:

Dear Sir—The annual election of Officers of the St. Louis Pharmaceutical Association took place on the 5th of January, at the Hall of the Association.

The retiring President, Mr. Eugene L. Massot, read his annual address. He states the Association to be in a prosperous condition, which is evidenced in the fact that the desire to obtain thorough pharmaceutical education is growing of greater importance, not only with the members of the Society, but also of the craft at large, which is the principal aim of this and all similar associations.

The following is the list of Officers for the present year (1860):

*President*—Enno Sander.

*Vice President*—S. D. Hendell.

*Second Vice President*—Thomas Tanton.

*Recording Secretary*—Wm. B. Parker.

*Corresponding Secretary*—Alex. Leitch.

*Treasurer*—Wm. H. Dornin.

*Executive Committee*—Wm. H. Dornin, E. L. Massot, Saml. D. Hendell, Thos. Scott, Theo. Kalb.

*Committee on Progress of Pharmacy*—James O'Gallagher, Wm. B. Parker, Alex. Leitch, T. Kalb, Wm. H. Dornin.

*Committee on Unofficial Formula*—James O'Gallagher, Hubert Primm, Thos. Scott, E. L. Massot, Wm. B. Parker.

Yours respectfully,

ALEX. LEITCH, Corres. Sec.

---

*Therapeutics and Materia Medica.* A systematic treatise on the action and uses of medicinal agents, including their description and history. By ALFRED STILLÉ, M. D., &c., &c. Philadelphia, Blanchard & Lea, 1860. 2 vols. octavo pp. 1788.

The volumes indicated above have long been in preparation by their author; during more than ten years he has engaged himself in their elaboration from the mass of records left by medical observers in the past, and especially in the present century, on the subject of Therapeutics.

Although the title indicates descriptive *Materia Medica* as included in the scope of the work, the reader soon finds that both *Materia Medica* and *Pharmacy* occupy a very subordinate position. The author occasionally permits himself to go into detail in his description and history of drugs, but rarely enters into pharmaceutical details beyond the most concise statement of the constitution and mode of preparation of official compounds. He evidently does not intend this portion of the work to be used for reference, as a dispensatory or formulary, as the relative proportions and quantities of ingredients in the formulæ are frequently not mentioned. The reader, for instance, is informed at page 452, in speaking of "Liquor Ferri Iodidi:—" This preparation differs from the last, [the solid

iodide of iron] by the addition of sugar to filtered liquor, which, also, is not evaporated. In this manner decomposition is prevented. The solution is of a pale green color, and has a strong inky taste." This description follows immediately after a succinct account of the Iodide of Iron, but in neither is any clue given to the proportion of salt in the solution. As this course is frequently adopted, it is clearly the object of the author to convey in general terms, an idea of the nature and characters of each pharmaceutical preparation, to aid the student or physician who may consult the work, to keep them in remembrance; whilst it is intended that for exact information in regard to manipulation and quantities, he should employ the Pharmacopœia or Dispensatory. In a word, the work is addressed to the Physician, not to the Apothecary, to the prescriber and not to the preparer of medicines; the great object of the book is to exhibit the action of medicines upon the human economy, both in its healthy and morbid conditions, and to point out when these agents may be most certainly and efficiently employed in curing disease. In pursuit of this end the author has devoted much time and research to ascertain the testimony of medical writers, pro and con, in relation to the curative powers of remedies, believing that "our knowledge of the usefulness of medicines rests altogether upon experience, but not upon that of any one man, however skilful, or of any age, however enlightened;" and "that their efficacy is attested by a multitude of witnesses, and is confirmed by time, which reduces the opinions of individuals to their just value, outlives the fashions of the day, and is unmoved by the prejudices of the schools. To experience, then, we must turn as to the ultimate and decisive arbiter of all questions respecting the curative powers of medicines, feeling assured that whenever the particular application of a remedy could be sustained by the testimony of the great Physicians of successive ages, our employment of it possesses the highest possible sanction."

The introduction includes general observations on the sources from which medicines are derived; the sources of knowledge in Therapeutics; the sources of knowledge respecting the action of medicines; the physiological, local, and remote action of medicines; the avenues by which medicines gain access to, and their effects in, the system; their curative action; their administration; the art of prescribing them; and lastly, their classification.

So far as we have observed Dr Stillé has no favorite theories to establish that have swayed his judgment in developing the subject; at every step we are struck with the careful and laborious research which has manifestly been employed to gather the views and experience of so many observers, with references to their original papers and volumes, a feature that will prove of great utility to the student who may desire to consult them. The work is written in a clear and classical style; no redundancy in words or expression mars his descriptions. The merit of the work as a treatise on Therapeutics, from the stand point of the Physician, we leave to our medical cotemporaries; it is for them to judge whether the author, in producing

this new contribution to the medical literature of the United States, has succeeded in throwing more light on the important, but difficult and too often obscure, subject of the real action of medicines after ingestion; and whether his views of their real curative powers, as expressed in the testimony he has adduced in their favor or against them, accords with the experience of others. Viewing the work with a pharmacist's eye and judgment, we at first felt disposed to express the disappointment in which our examination had resulted, on finding that the author, on treating a subject which claims the aid of pharmacy at every step, should have so imperfectly represented the valuable influence it contributes in the successful prescription of medicines, as to leave untold so much that is important in official as well as in extemporaneous pharmacy. For instance, the art of prescribing medicines involves not only their adaptation to the disease treated, and to the particular condition of the patient at the time, as the author has well said; but also their compatible association, in the most eligible and least repugnant form. The best remedies often prove useless from the nausea they excite, and it certainly is an important, though not generally practised, part of the therapist's duty, to point out the most elegant and appropriate form for the extemporaneous or permanent association of drugs. The skilful Apothecary might often modify advantageously, the physical condition and sensible properties of the medicines he dispenses by prescription, were it safe and proper for him to assume the responsibility, which it is not;—and perhaps the knowledge to which we allude belongs more to pharmacy than to therapeutics; yet we believe it may properly enter into a work of the character of the present, and would greatly aid in improving the "art of writing prescriptions" as practised by many Physicians. But, on further reflection, we believe, that in taking this course the author preferred to refer his readers to the special treatises, rather than to enter on practical details, to elucidate which successfully would have involved a familiarity with the operations of practical pharmacy. For this reason we withhold any criticism in this direction, to which the work may be obnoxious, and with a firm conviction of the honest purpose of the author, and a high estimate of the learning and ability his production manifests, we most cordially commend it to the careful perusal of our medical brethren.

We had almost forgotten to say, that in point of mechanical execution and the evident care which has marked its progress through the press, the work is highly creditable to all concerned.

---

*Introductory Lectures and Addresses on Medical subjects, delivered chiefly before the Medical Classes of the University of Pennsylvania.* By GEORGE B. WOOD, M. D., LL. D., President of the American Philosophical Society, &c., &c. Philadelphia, J. B. Lippincott & Co. 1859. pp. 460.

The author of this volume, as his friends are aware, is about to retire from the active duties of the medical profession, in which he has so long



and efficiently labored. Previous to taking this step, he determined to publish in a collective form many of the Introductory Lectures which have been delivered during his long career as a teacher; besides several addresses, biographical and otherwise, more or less relating to medical subjects. The first of the collection is an address to the members of the Philadelphia College of Pharmacy thirty-six years ago, at a period when its school of Pharmacy, in which the author at that time occupied the chair of chemistry, was in a very depressed state. The object of the address was to arouse the members of the Institution to a clearer appreciation of its condition, its duties, its powers, and in what way these should be exerted to fulfil the destiny, to which, in the mind of the writer, it was called. In concluding this address, which contains many excellent points, Dr. Wood uses the following prophetic remarks: "With great confidence we may anticipate, not perhaps an immediate, but certainly a high degree of ultimate prosperity for the Institution. In the progress of years, it will out-grow its present sick and fragile condition. Strong internally by its own regulations, and externally by your unanimous support, it will be enabled to exercise over your profession an authority equally beneficial to yourselves and to the community. Provided with ample means of instruction, and holding out strong inducements to studious application, it will diffuse copious and accurate knowledge among the apprentices to your art, and will greatly elevate your standard of scientific attainments. Finally, when the division of the professions shall have become more general, and apothecaries shall be required, not only in our larger towns, but in almost every village of the country, it may widen the sphere of its attraction far beyond the limits originally contemplated, and render the city of Philadelphia the centre of Pharmaceutical, as it has long been of medical instruction to the whole extent of the Union."

In glancing over the medical addresses, one is struck by their apparent unity of design—by the relationship they bear to each other as parts of a whole—though delivered at periods and under circumstances greatly differing. The first, on the history of the *Materia Medica*, and the next, on the history of the *Materia Medica* in the United States, are specially interesting to the apothecary, as throwing much light on the history of our art, and on the influences which in this country have tended to its development.

By the frequent employment of foot-notes, the author has added much to the interest of the subjects discussed by explanations and comments. One of these, appended to an address to the Pharmaceutical Graduates in 1833, referring to the then rising influence of the College of Pharmacy in Philadelphia, we cannot refrain from transcribing.

"Justice requires that some allusion should here be made to the services of a gentleman, to whom the Pharmacy of this country is greatly indebted; I refer to Daniel B. Smith, formerly President of the Philadelphia College of Pharmacy. Standing among the first apothecaries of his time in literary and scientific attainment, peculiar skill in his art, and general reputation, he entered zealously into the movement which originated and sustained the

College of Pharmacy; and, by his own written contributions, the encouragement which he extended to the efforts of younger men, and the measures set on foot, or ardently supported by him, for the improvement in various ways of the profession to which he was attached, he contributed, I think, more than any other one individual, to the impetus which has carried the pharmacy of this country to its present relatively high position. Should this notice reach him in his retirement, the author hopes that he will receive it kindly, as the testimony of one who has known him for more than forty years, has always esteemed him highly, and entertains a grateful sense of the early aid and encouragement extended by him to his own professional labors."

Two lectures, descriptive of the state of the medical profession in Great Britain and on the Continent of Europe, the results of the author's observations during his transatlantic visits, are particularly interesting to the general medical reader. The biographical memoirs of Dr. Joseph Parrish and Dr. S. G. Morton—men whose deeds on the fields of medicine and science have secured them a grateful remembrance in and out of the medical profession—fitly conclude the volume. From these, as from others of the addresses, it would afford us much gratification to quote, but the small space at command constrains us to forego the pleasure. The book is handsomely printed, and is dedicated to the Graduates of the University of Pennsylvania of the Classes for 1836 to 1860 inclusive.

---

*A Medico-legal Treatise on Malpractice and Medical Evidence, comprising the elements of Medical Jurisprudence.* By JOHN J. ELWELL, M.D., Member of the Cleveland Bar. New York, John S. Voorhees, No. 20 Nassau St., New York, 1860; pp. 588.

We acknowledge the reception of this work from the publishers just as we were going to press, and too late to notice it in this number.

---

*The Chemical News*, with which is incorporated the *Chemical Gazette*, London, in 16 page numbers, quarto, issued weekly.

This work succeeds the *Chemical Gazette*, so long and favorably known as a depository of scientific and industrial chemistry, and so ably conducted by Dr. Wm. Francis. Its successor is got up in a more popular style, evidently addressed more to the masses than was the "*Gazette*," which was noted for its strict adherence to the publication of chemical papers of a scientific cast. The *Chemical News* embraces Chemistry, scientific and technical, Pharmacy, Toxicology, notices of patents and books, correspondence, laboratory memoranda, etc., and is conducted by Wm. Crookes.

---

*Notes and Queries*, a medium of intercommunication for Literary men, Artists, Antiquaries, Genealogists, &c., London, 24 pp. quarto, weekly.

The reception of a number of this periodical is acknowledged from Daniel Hanbury.